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Salvaging Scrap in Cadillac Plant

New Building Erected by Automobile Company at Detroit for Special Purpose of Handling Various Grades of Old Material

THE Cadillac Motor Car Co., Detroit, recently established in connection with its new plant a scrap salvage department located in a separate building designed for this purpose and through which all iron and steel and non-ferrous scrap, produced in its various manufacturing departments, is handled. The erection of the salvage building reduces the cost and increases the efficiency of scrap handling and is a step in the company's policy of economic production, in that scrap, instead of being allowed to accumulate in the manufacturing departments, releases valuable space in the manufacturing building for production work.

The predominating feature of the scrap salvage department is the installation of equipment for breaking up and mechanically handling long turnings, the output of which averages 15 tons per day. These pass through a crusher which breaks up the bulky coils into small pieces or short shoveling turnings, making the material much more compact so that it is easier and cheaper to handle and twice as much can be loaded in a car. At the same time the market value of the scrap is increased, for after being broken into small pieces it is more suitable for use in the charging boxes of open-hearth furnaces and can also be melted in blast furnaces. Very few blast furnaces can use long turnings because of their bulky character. Another advantage of the crushing process is that the small pieces of scrap are safer to handle than the bulky coils. With a system of conveyors, the process of handling the turnings from the time they reach the crusher until they are loaded on waiting cars is continuous. The plant has a capacity for breaking up and delivering to cars 20 tons of turnings in 9 hr.

The scrap salvage department is located in a one

Scrap as Fast as It Is Accumulated Is Taken to the Scrap Salvage Department in Side-dump Trucks Hauled by Storage Battery Tractors. If desired the loaded hoppers are lifted from the trucks by means of the overhead crane as shown

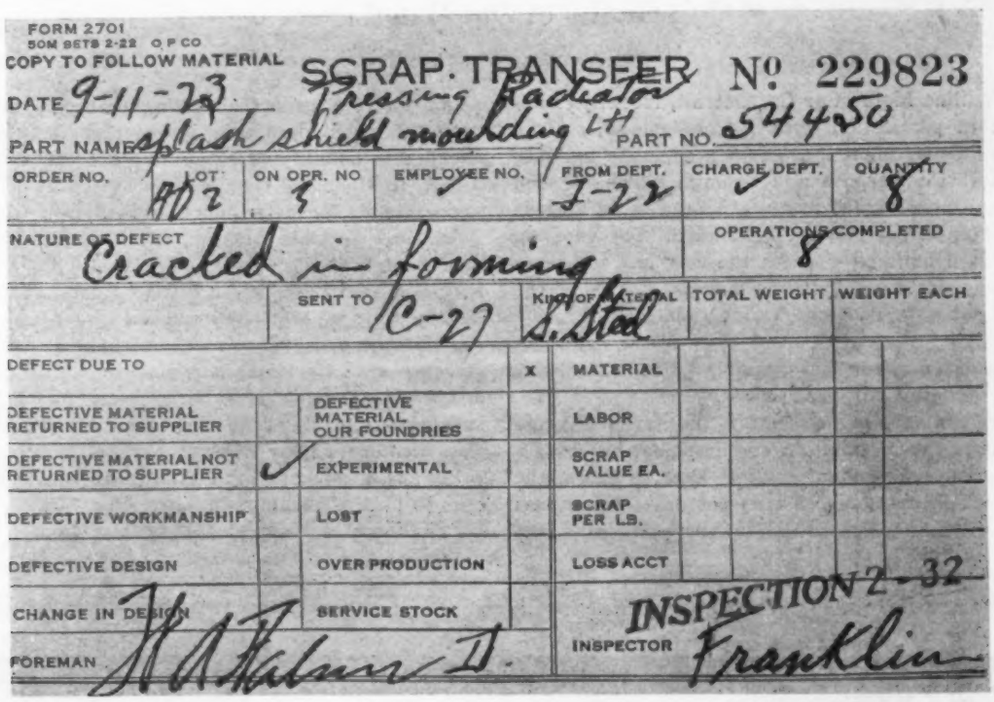
story and basement brick and steel building 60 x 100 ft. and 50 ft. in height to the peak of the roof and is served by a 5-ton electric traveling crane with a runway 30 ft. above the floor. Turnings are hauled to the building from the various manufacturing departments in side dump trucks pulled by storage battery tractors. Usually a tractor draws two trailers each loaded with 500 lb. of turnings.

Oil Is Recovered

The long turnings are dumped in a pile on the concrete floor and left there half a day to allow the oil to drain off, the oil passing through a drain in the floor to the basement. After much of the oil has been recovered in this manner, the turnings are removed with a magnet on the overhead crane and dropped at the side of a hopper level with the floor and are shoveled into the hopper which feeds into the crushing machine located in the basement. In this crusher driven by a 40-hp. motor the long turnings are broken up into small pieces, few of these pieces being over 2 in. long. From the crusher the scrap passes over a short bucket conveyor to a bucket elevator, which carries it to near the top of the building and drops it into a steel bin of about 2 tons capacity.

From this bin the scrap goes to an oil extractor in which the remaining oil is removed. After the oil is extracted by the rapid revolution of the scrap, the scrap container in the extractor is lifted out by an air hoist attached to a jib crane and the contents are dumped into a riddle. Pieces of scrap that have passed through the crusher without being broken to small enough sizes are removed from the lower end of the riddle. The small pieces pass through the riddle to a bucket elevator in the basement, which carries the scrap up near the roof and discharges it into a horizontal conveyor, which delivers it to a chute that passes out through the side of the building and over a railroad siding, and the material is discharged through the chute into a car. If a car should not be on hand for loading, the scrap is turned into another chute that discharges it into a storage bin on the floor, and when a car is available the scrap is shoveled from this bin through the floor onto a conveyor in the basement and is again elevated and discharged into a car. The system is so arranged that when soda chips are handled, these, instead of going through the oil extractor, are delivered directly to the riddle.

The oil from the floor drain and from the oil separator passes through oil lines into a 500-gal. tank in the basement and through a wire screen strainer. From this tank it is pumped underground to the oil house a short distance away, filtered and placed in 500-gal. tanks, from which it is pumped back to the various manufacturing departments for use. A separate oil extractor of smaller sizes than are used for the turnings is provided for removing oil from brass chips. This oil passes into a separate tank, where it is metered to keep a record of the oil consumption, and is then discharged into the main tank. About 700 gal. of oil is salvaged per day.



FORM 2701
50M SETS 2-22 O P CO
COPY TO FOLLOW MATERIAL

SCRAP TRANSFER No. 229823

DATE 9-11-23 Pressing Radiator
PART NAME Splash shield moulding LH PART NO. 54450

ORDER NO.	LOT	ON OPR. NO	EMPLOYEE NO.	FROM DEPT.	CHARGE DEPT.	QUANTITY
	402	3	✓	J-22	✓	8

NATURE OF DEFECT Cracked in forming — OPERATIONS COMPLETED 8

	SENT TO	KIND OF MATERIAL	TOTAL WEIGHT	WEIGHT EACH
	C-27	S. Steel		

DEFECT DUE TO		X	MATERIAL		
DEFECTIVE MATERIAL RETURNED TO SUPPLIER	DEFECTIVE MATERIAL OUR FOUNDRIES		LABOR		
DEFECTIVE MATERIAL NOT RETURNED TO SUPPLIER	✓ EXPERIMENTAL		SCRAP VALUE EA.		
DEFECTIVE WORKMANSHIP	LOST		SCRAP PER LB.		
DEFECTIVE DESIGN	OVER PRODUCTION		LOSS ACCT		
CHANGE IN DESIGN	SERVICE STOCK		INSPECTION 2-32		
FOREMAN W. A. Fabian D.			INSPECTOR Franklin		

When Material Is Ordered to the Scrap Department, the Inspector Fills Out in Quadruplicate a Scrap Transfer Form. One copy goes to the planning department, another to the accounting department, a third to the scrap salvage department and the fourth is retained by the inspector

Other Grades of Scrap Sorted

Various grades of scrap other than turnings are sorted in the salvage department and placed in storage bins having a capacity of a carload or more and located along one side of the building. The scrap is allowed to accumulate in these bins until there is enough of one grade to make a full carload. Above each bin is a chute extending out to the side of the building and over the loading track. When a car is to be loaded the material is handled to the chute with the overhead crane.

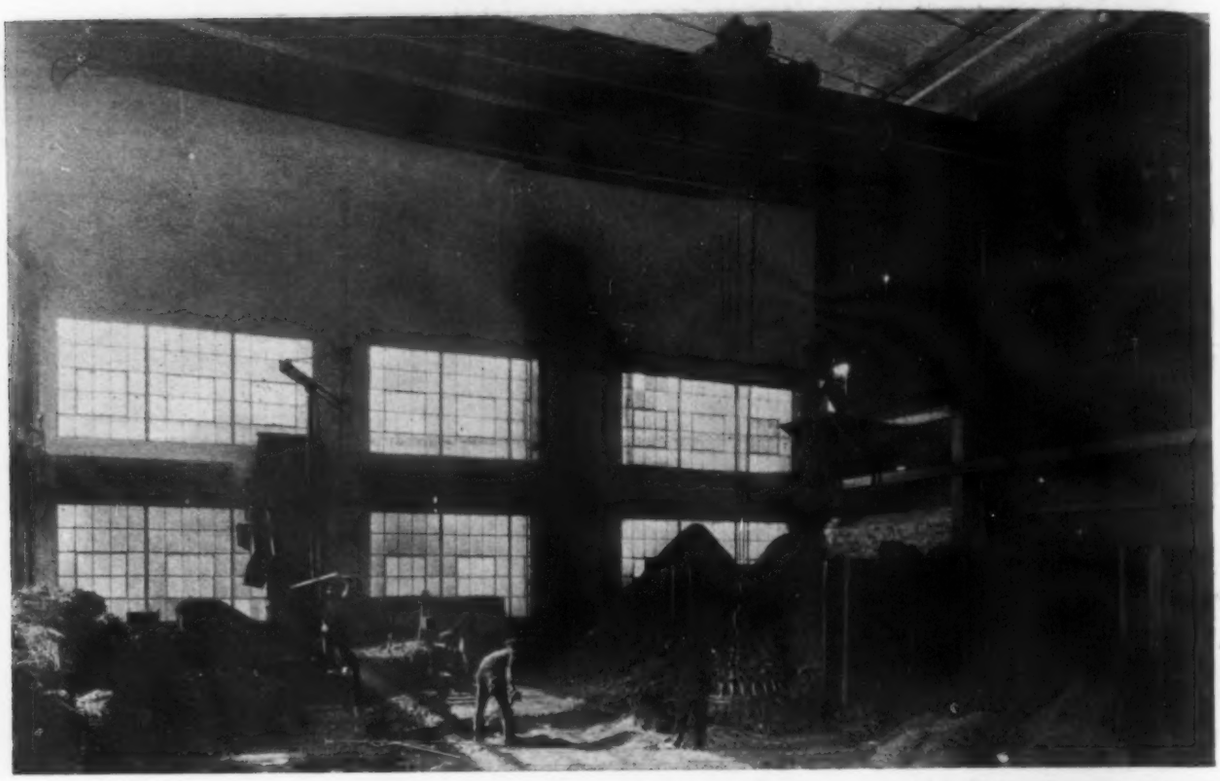
Under the system adopted, handling in small lots in motor trucks is eliminated, all iron and steel scrap being shipped in full carloads except portions of certain grades that the company uses in its own foundry. After the oil is extracted, brass scrap is placed in steel barrels and sold.

A complete record of scrap that is ordinarily produced in manufacturing operations, such as borings and

Turnings Are Shoveled into a Hopper Under the Hood that Appears in the Foreground and Pass Through a Crusher in the Basement. From the crusher the broken scrap is delivered by a bucket conveyor and bucket elevator to the bin at the left and from this it is shoveled into the oil extractor that adjoins the bin. An air hoist lifts the scrap container from the extractor and dumps the scrap on to a riddle along the wall back of the extractor. The material reduced sufficiently in size passes through the riddle to the basement and up the bucket elevator adjoining the wall and then is received by a horizontal conveyor that delivers it into the hopper at the corner of the building, through which it is discharged through a chute into a railroad car on a siding outside

turnings, is not kept, but forms are provided for keeping a record of all material that is sent to the scrap salvage department because of defects that develop during manufacturing operations. An inspector fills out quadruplicate copies of a scrap transfer form for each lot of material he orders scrapped. One copy of this

The Elevator at the Left and the Bin Which Serve the Oil Extractor in the Foreground



On One Side of the Building Are Bins for Various Grades of Scrap Other than Turnings and Above Each Bin Is a Chute. This scrap is handled by means of the overhead crane and a lifting magnet and is dumped through the chute into railroad cars outside

goes to the planning department, one to the accounting department, one follows the scrap to the scrap salvage department and the fourth stays on the inspector's book. These scrap transfer tickets show the department from which the scrap came, the part name and number, quantity, nature of the defect, kind of material, number of operations performed on the piece before it was scrapped, as well as supplying other data.

Efficiency of Standardization in Germany

A striking example of the efficiency of national standardization as it has been developed in Germany is cited by Dr. A. P. Agnew, secretary of the American Engineering Standards Committee in the case of a rush order placed with German manufacturers for 200 locomotives for delivery to Russia. "Production of different parts was allotted to 17 different manufacturers to be produced strictly upon the plan of interchangeable parts, no one manufacturer making a complete locomotive. No serious practical difficulty was encountered in filling the order. The inspectors made a particularly striking test of the feasibility and accuracy of the plan by ordering a complete locomotive to be assembled from parts chosen at random from the parts furnished by the 17 manufacturers. It proved to be ready for service immediately after assembly without necessity of disassembling for readjustment."

The appearance of consulting engineering firms specializing in standardization work is an interesting development of the last few years. There are now five such firms in Germany. This work is closely connected with industrial or efficiency engineering, in which there is now great and growing interest in Germany. In general, it appears to be much more closely connected with the movement for industrial standardization than is the case in this country. The largest of these firms devotes about half of its time to standardization work, employing a staff of over 40. They have as their clients trade associations as well as individual firms.

One of their clients is the trade association representing the motor vehicle industry. In this work they perform many of the services that would be done by an ordinary headquarters standardization staff.

Of the companies which are their clients, some maintain their own standards bureaus, which take care of the greater part of the detailed work, leaving to the consulting firm only the more important and difficult questions. In other cases, the consulting firm does a large amount of the detailed work.

Another most interesting development is the work of consulting engineers on trade catalogs for companies. This is particularly significant, as it is carrying standardization a step farther than is usual, by introducing it into the sales organization and sales policy. In this, careful consideration is given to the question of limiting the number of types, ranges and sizes offered for sale, placing proper emphasis in the catalog on these particular items on which the company wishes to concentrate, and, in general, in featuring and often advertising the relation of the firm's products to the standardization movement.

More Horse Power

At the National Horse Show in New York a team weighing 3575 lb. moved a load requiring 2450 lb. tractive effort over a distance of 12 ft. in 6 sec. They developed sufficient power to start a truck load of 32,000 lb. on a level granite block pavement. This power would be sufficient to keep a load of 200,000 lb. moving on such a pavement after the start had been made. This record of 2450 lb. tractive effort exceeds the 2400 lb. record made at Ames, Iowa, last summer.

E. B. Bowman, advertising manager Carborundum Co., Niagara Falls, was the guest of the New England Foundrymen's Association at its December meeting held the 12th at the Exchange Club, Boston. Mr. Bowman's talk was on Niagara Falls power development, the manufacture of carborundum and the application of carborundum in grinding and foundry abrasives.

Properties of Steel Containing Tellurium

Experimental Heat of Cast Steel—Forging Qualities and Structure—Tellurium Present as a Telluride

BY DR. G. B. WATERHOUSE AND I. N. ZAVARINE*

TELLURIUM is not one of the elements used for alloying purposes with steel, and references to its use or occurrence in this capacity are extremely scarce or non-existent. The authors, therefore, welcomed an opportunity to investigate a steel containing this element, and believe a short account of the results obtained will be of general interest. Tellurium is a silver white solid with metallic luster[1]. In the crystalline form it is very brittle and easily powdered. There has been some dispute regarding the atomic weight, but it is commonly accepted as 127.5 (O = 16). The melting point varies slightly according to different observers from 437 to 455 deg. C.,[2] and is usually given as 452 deg. C. The boiling point is given as 1390 deg. C., and if air is excluded it gives a golden yellow vapor. In the presence of air it burns with a blue flame tinged with green and gives white vapors of TeO_2. The specific gravity of the crystalline variety is 6.27. There is also an amorphous form with sp. gr. of 6.015, which changes to the crystalline variety on heating.

It is closely associated with selenium and in the periodic table is placed with oxygen, sulphur and selenium. In its chemical reactions it is similar to sulphur. For much of our knowledge regarding its chemistry we are indebted to the work of Dr. Victor Lenher of the University of Wisconsin and his students.[3] Tellurium is insoluble in water or hydrochloric acid, but is dissolved by nitric acid or concentrated sulphuric acid. It does not tarnish in moist air, and this property may be of commercial importance. At present the uses of the metal are very limited, and the production is small, the possible annual supply from the copper refineries being only about 125,000 lb.[4] Among the compounds the tellurides of gold have been known to metallurgists for many years, and it is of interest that a compound FeTe has been made, and its heat of formation determined. This telluride of iron will scratch glass, is rather tough and is not altered by dry air. It is formed by an exothermic reaction, and can be readily made at a low red heat.

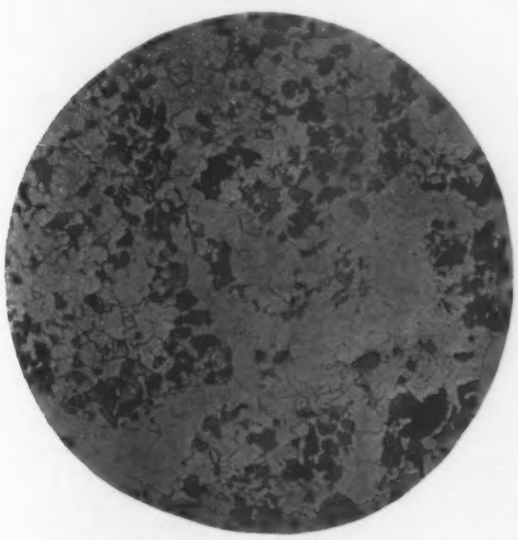


Fig. 1—Steel Containing Tellurium, x 200

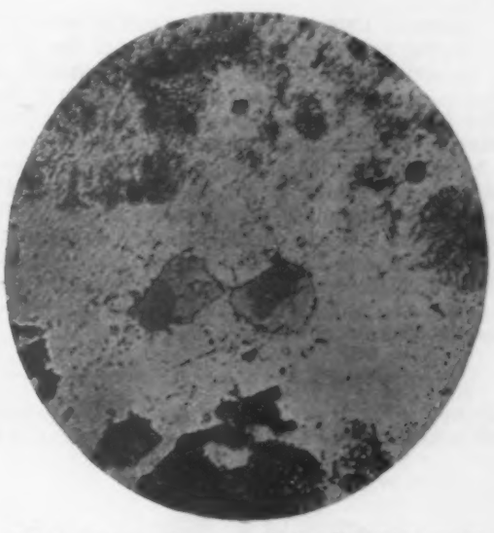


Fig. 2—Same as Fig. 1 at Higher Magnification or 1000 Diameters

Making of the Steel

The material investigated came from a 3-ton heat of steel made in the electric furnace of the Bonney-Floyd Co., Columbus, Ohio, according to their regular practice of making steel for steel castings. When about 1000 lb. of metal had been tapped into the ladle the addition of metallic tellurium was made without any stoppage of the pouring. In other words the tellurium was added to the ladle when the bottom was well covered with steel. The amount was 20 lb., and the results of analysis show that about 40 per cent was retained by the metal. Throughout the pouring a whitish yellow vapor was observed coming from the top of the metal and slag in the ladle, and from the stream of metal entering the molds. The tellurium was supplied by the United States Smelting, Refining & Mining Co.

Properties of Annealed Castings

The analysis of the steel was as follows:

	Per Cent		Per Cent
Carbon	0.24	Sulphur	0.039
Manganese	0.64	Silicon	0.32
Phosphorus	0.039	Tellurium	0.12

Two sample of the cast steel after annealing in the usual way gave the results shown below:

Yield point	45,000	42,850 lb. per sq. in.
Ultimate stress	70,000	71,750 lb. per sq. in.
Elongation in 2 in.	11.5	16.0 per cent
Reduction in area	13.5	18.5 per cent

Structure of Annealed Steel

These results show somewhat lower ductility than would be expected in a well-annealed steel casting with carbon 0.24 per cent, and an explanation was sought in the microstructure. Normal magnification shows the structure illustrated by Fig. 1, and the arrange-

*Professor of metallurgy and instructor in heat treatment, respectively, Massachusetts Institute of Technology.

ment of the pearlite is evidence of good annealing. Examination with higher magnification clearly shows the presence of a new non-metallic impurity closely associated with the well-known constituent generally called manganese sulphide. This is well shown in

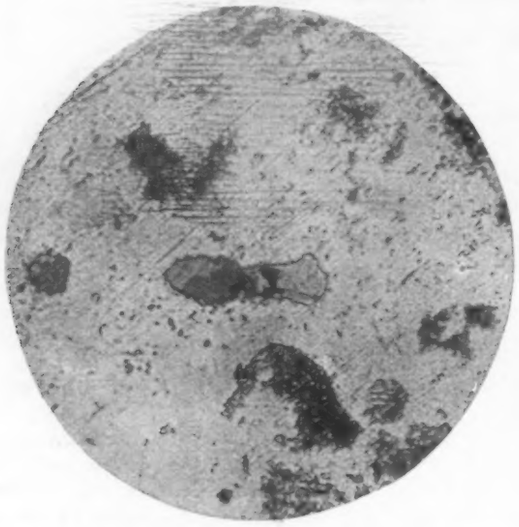


Fig. 3—Manganese Sulphide and a Tellurium Compound, x 1000

Fig. 2 taken at 1000 diameters after etching with picric acid. In the two areas near the center of the picture may be seen the dove-gray manganese sulphide, and with it is also seen the new constituent which is much lighter in color. The authors believe this constituent is due to the tellurium, and provisionally at least it can be called telluride of iron. This new constituent is also clearly shown in Fig. 3, taken at 1000 dias. Reference may be made to a previous article by Professor Arnold and one of the authors,[4] where a steel was described and illustrated having manganese sulphide and sulphide of iron existing together in somewhat the same way as these two sonims, using Henry Hibbard's term for non-metallic impurities.

Properties and Structure of Forged Steel

It was thought advisable to see how the telluride would behave under mechanical work, and a piece of the

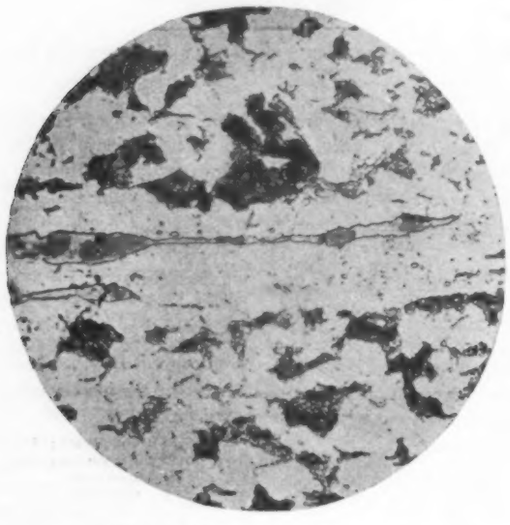


Fig. 4—Forging Effect on Steel Containing Tellurium, x 1000

annealed casting was heated and forged under a light steam hammer, the amount of reduction being about 65 per cent. The steel forged well, giving no evidence of red shortness. There was enough material for four short test pieces, and they were tested after the following treatment:

No. 1—As forged.
No. 2—Heating uniformly to 1575 deg. Fahr., cooling in air.
No. 3—Heating as before, cooling slowly in furnace.
No. 4—Heating as before, quenching in oil and reheating to 1100 deg. Fahr. and cooling in air.

The results of the tensile tests are given below:

No.	Treatment	Yield Point Lb. per	Ult. Stress Sq. In.	Elon., Per Cent in 1 In.	Redn. of Area, Per Cent	Brinell No.
1	As forged	59,250	83,250	17.5	38.7	179
2	Heated 1575 deg. Fahr, cooled air	58,500	82,500	19.5	44.5	170
3	Heated 1575 deg. Fahr., cooled furnace	48,120	77.000	19.0	42.5	143
4	Heated 1575 deg. Fahr., quenched oil, drawn 1100 deg. Fahr. ...	65,000	88,500	21.0	48.1	179

On examination with the microscope the telluride was found to have been drawn out by the forging action fully as well if not better than the manganese sulphide, as is clearly shown in Figs. 4 and 5, both taken at 1000 diameters.

Summary

A careful examination of a steel containing 0.12 per cent tellurium shows the presence of a non-metallic constituent that is probably a telluride, closely associated with manganese sulphide. When the steel is forged this telluride does not break up but elongates fully as well if not better than manganese sulphide. The steel is lower in ductility than normal material without the tellurium.

The results would indicate that it might be well to investigate the influence of tellurium in regard to the free cutting or free machining properties of the steel, to see whether this element could be used instead of sulphur for that purpose. In conclusion the authors would express their indebtedness to Dr. G. H. Clevenger and F. S. Mulock of the United States Smelting, Refining & Mining Co. for the opportunity of investigating this interesting material.

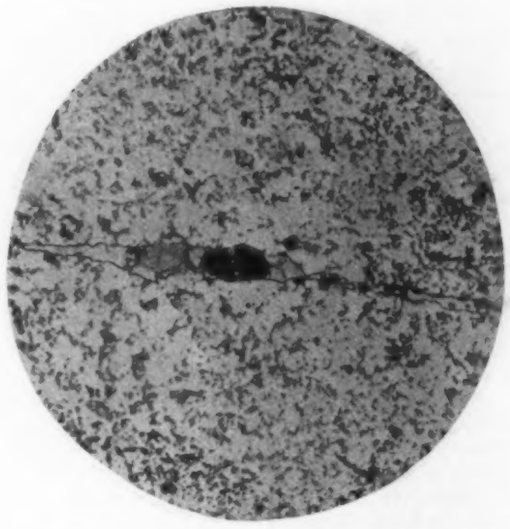


Fig. 5—Another Example of Effect of Forging This Steel, x 1000

References

1. H. A. Doerner: "Tellurium." Reports of Investigations. Bureau of Mines, Serial No. 2385, August, 1922.
2. Landolt-Bornstein, 4th Edition.
3. Victor Lenher: "Occurrence, Chemistry and Uses of Selenium and Tellurium." February, 1923, meeting Am. Inst. Min. and Met. Engrs. C. A. Tibbals, Jr.: "A Study of Tellurides." Doctor's Thesis, Univ. of Wis., 1909. (This contains a great many references.) E. Wolesensky: "A Study of the Metallic Tellurites." Doctor's Thesis, Univ. of Wis., 1909. E. B. Hutchins, Jr.: "A Contribution to the Chemistry of the Tellurates." Doctor's Thesis, Univ. of Wis., 1905.
4. J. O. Arnold and G. B. Waterhouse: "On the Influence of Sulphur and Manganese on Steel." *Journal* Iron and Steel Institute, vol. 63, 1903, No. 1, p. 136.

Motor-Operated Centrifugal Pumps

Steel Plant Water Supply Problems—Test Data and Cost Comparisons—Definite Motor Guarantees Essential

BY B. A. CORNWELL*

IN the steel industry, one of the most important factors in maintaining and increasing production is the efficiency and the reliability of the water supply system, which we feel should be electrically driven.

Centrifugal pumps are especially suited for handling large quantities of water quickly and in many plants this type of pump has already been adapted for supplying water under low heads for blast furnaces, condensers, cooling water systems, etc. A centrifugal pump consists primarily of a water wheel revolving in a case. The water enters at the center of the wheel and is discharged from the periphery through the discharge nozzles of the pump case. In this type of pump, the velocity imparted to the water by the impeller determines the head. We then deduce from this the following general laws governing the action of all centrifugal pumps:

1. The head varies as the square of the speed.
2. The quantity of water pumped varies directly as the speed.
3. The power required to drive the pump varies as the cube of the speed.

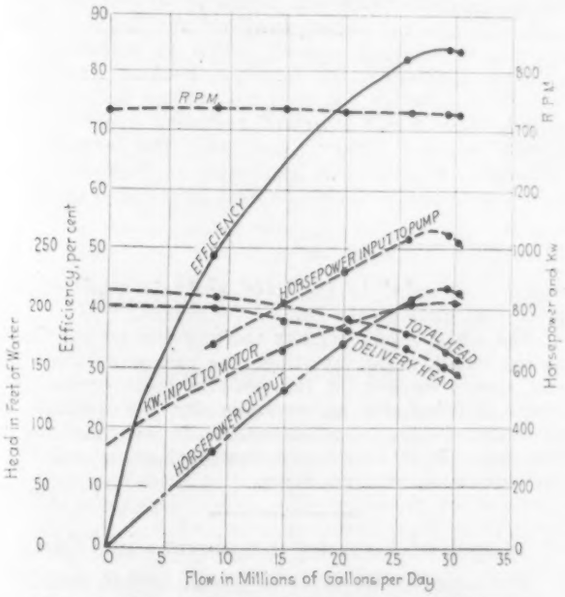


Fig. 1—Test of Allis-Chalmers Centrifugal Pump Gave Results Shown Above

Test Data on Allis-Chalmers Motor-Driven Centrifugal Pump. Rated capacity, 25,000,000 gal.; single-stage, double-suction type; suction and discharge nozzles each 24 in. diameter; slip ring induction motor of 1000 hp., 3 phase, 25 cycle, 750 r.p.m.

Delivering (Gal.)	Input to Pump (Hp.)	Total Head (Ft.)	Efficiency (Per Cent) Pump	Motor
10,000,000	700	210	52.5	91.8
15,000,000	825	205	64.5	92.6
20,000,000	910	196	74.0	93.0
25,000,000	995	183	81.0	93.2
30,000,000	1030	165	84.0	93.2

Performance and operation of typical centrifugal pumps as used in steel plants can best be seen by referring to the characteristic curves shown in Figs. 1 and 2, obtained from tests recently made on a 1000 hp., 6600-volt wound rotor induction motor driving a 25,000,000-gal. centrifugal pump. This pump is of the single stage double suction type with bottom suction, to operate against a total head of 165 ft.

Data and test results obtained are shown in the table. The motor driving this pump is designed for a temperature rise of 40 deg. Cent. (72 deg. Fahr.) with full load for 24 hr. and a temperature rise of 55 deg. Cent. (99 deg. Fahr.) with 25 per cent overload for 2 hr. immediately following a full load run of 24 hr.

As can be seen from these curves, with the discharge valve closed the efficiency is zero, since no useful work is being done. The horsepower required under this condition is consumed in friction and dissipates itself as heat, with the result that an electrically driven pump of this type cannot be operated with its discharge valve closed for more than 15 or 20 min. without overheating. As soon as the discharge valve is opened, the capacity increases as the efficiency increases, until it reaches a maximum of 30,000,000 gal. per day at an efficiency of 84 per cent. This particular pump has been in operation since 1918 and the results shown by this test indicate that it is still capable of delivering the same capacity as obtained five years ago and that this capacity is in excess of the guaranteed capacity.

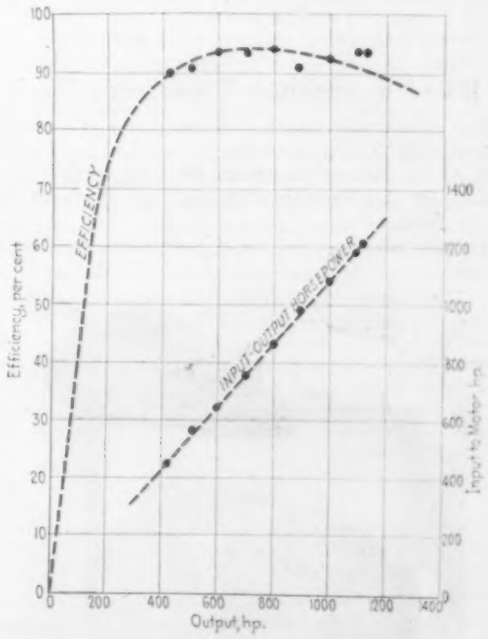


Fig. 2—Curves for 1000-Hp. 6600-Volt Motor Driving a 25,000,000-Gal. Centrifugal Pump. Maximum efficiency lies between 600 and 800 hp. output

Influence of Variation in Frequency

In making tests on a.c. motor driven pumps, we often find that there are certain changes in the a.c. motor characteristics due to changes in the frequency and voltage of the generating station. When there is a change from normal conditions there will be a loss in efficiency unless there is a corresponding change in the other variables to restore the original values. For instance, a drop in frequency means increased density of the field with lower efficiency and increased heating. If, however, there is a corresponding drop in voltage at the same time, the motor will operate under normal density, but with decrease in output proportional to the

*Electrical engineer Carnegie Steel Co., Youngstown, Ohio. This is an abstract of a paper read before the Buffalo convention of the Association of Iron and Steel Electrical Engineers.

decrease in the speed, which lowers with the frequency.

In comparing installation and other costs, assuming 1000 hp., and the turbine-driven installations with starters, condensers and auxiliaries, the author used a figure of $15,400 for an induction motor driving pump unit. With the synchronous motor, the figure was $15,800. With the steam turbine-driven pumping unit, the figure was $38,000. Buildings, wiring and piping were not included.

Operating cost for 30,000,000 gal. per day at 165 ft. head is given for the steam turbine-driven pump at 0,288c. per 1000 gal. By the motor-operated centrifugal pump, the figure is given as 0.238c. per 1000 gal.

Better Efficiency and Lower Costs

Investigations have shown that, in every case of the many instances where steam pumping equipments have been entirely replaced by electric driven pumping outfits, the efficiency and the operating costs have been greatly improved. A large number of steam driven city water pumping stations have been electrified, with the principal idea of getting better efficiency and more reliable service at less cost. However, in connection with the electrically driven pumping stations, steam driven pumps in many cases are necessary to insure a continuous supply of water in case of failure of the electric power.

It is generally conceded that, where electric power is available, there is no satisfactory comparison between the electric motor and gas or steam engine drive for centrifugal pumps. The first cost and cost of maintenance and attendance are considerably less; the simplicity and the reliability much superior and the power cost ranges from 25 to 50 per cent less, as has been demonstrated from tests.

Discussion

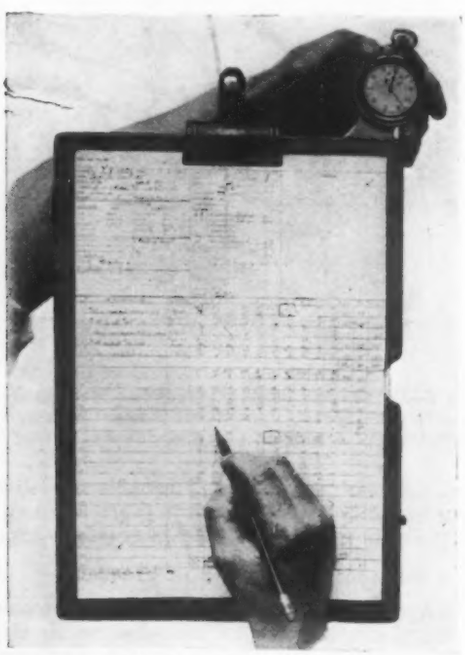
G. H. Cramer spoke particularly of a hard pump problem in the case of quenching cars of coke at the by-product ovens. A tank of 10,000 gal. capacity was emptied and had to be refilled on a 3-second cycle. This was particularly hard on the starting equipment for the pump. By using motors for this purpose, enough was saved in maintenance and repairs in a single year to pay for the installation of the motors. For this service, a Westinghouse engineer stated that self-starting, synchronous motors, designed for high speed and operating with thermostatic control, would be very useful.

R. G. Nye, Buffalo Steam Pump Co., pointed out that the difference between a motor designed for 50 deg. temperature rise and one designed for 40 deg. was a minor consideration, provided a definite guarantee was obtained as to what the motor would stand. It was brought out that the 40 deg. motors were definitely designed for an overload of 25 per cent maintained for 2 hr. without exceeding the temperature rating. When the temperature figure was raised to 50 deg., in most cases this was not accompanied by any definite guarantee as to overload capacity, either in percentage or time. Consequently, the condition became less satisfactory than before. It does not matter to the pump manufacturer which standard prevails, provided the definite overload capacity goes with the temperature standard. Without this guarantee it frequently becomes necessary to instal the next larger size motor.

Board to Facilitate Time Study Work

The time-study board illustrated, which is the invention of T. R. Hough and is intended to facilitate the work of time study observers, has been placed on the market by the Stein & Ellbogen Co., 31 North State Street, Chicago.

In addition to providing a convenient writing surface for holding the time study record blank, the board holds the watch in such position that the latter may be operated with the left hand as shown, the board resting on the left arm and leaving the right hand entirely free for recording the figures. The lock holder for the watch holds the watch securely in the position most convenient for operation and protects the watch against breakage. The inclination of the watch is intended to facilitate accurate reading and to prevent glare on the face of the watch.



Time Study Board. The watch may be operated with the left hand and the board held as shown

The movable clip permits shifting the record blank on the board, clip it at either the top or at the side, and always have it in the position most convenient. The board includes an envelope for the storage of schedules of standard speeds and feeds and other working data. With reasonable treatment it is said that the woodwork will not warp.

Wages of Foundry Employees in Ohio

Third-quarter wages of employees in 134 foundries reporting to the Ohio State Foundrymen's Association compare with those in the July report as follows: An increase per hr. for common labor of 0.028c., for pattern makers, 0.102c.; for core makers, 0.001c.; a decrease for brass molders of 0.020c. and for iron molders, 0.045c. The total of employees represented in the October report is 8163, living in 59 communities.

It was revealed in a recent survey made by the National Industrial Conference Board that American labor is receiving higher "real" wages today than at any time since 1913, not excepting the peak period of 1920. This may be attributed in part at least to the decline in cost of living, which in the survey made last July was 20.8 per cent below the peak prices of 1920.

Germany's Foreign Trade in Steel

Germany's exports of steel in August are reported by *Stahl und Eisen* to have been 132,789 metric tons, making the total to Sept. 1, this year, 1,241,052 tons as compared with 1,645,104 tons for the same 8 months last year. Imports were 221,112 tons in August, which brings the total to Sept. 1, this year, to 1,339,085 tons, compared with 1,424,483 tons to Sept. 1, 1922.

The H. P. Smith Co., Westfield, Mass., manufacturer of radiators and boilers, has awarded an increase approximating 10 per cent in wages of molders. The day wage scale is now $7.20, contrasted with $6.60 and extras which brought the total up to about $7 the past year. Piecework molders will receive a corresponding increase in pay. The company employs 300 molders, and plans to increase this number early next year.

Present Status of Pressed Metal Industry

History of Industry and Causes Retarding Expansion in Proportion to Possibilities—Application of Engineering to Sales a Basic Factor

A METHOD for the stabilization of the pressed metal industry, through the development of the function of engineering as applied to the sale of pressed metal products, was presented in a paper under the title of "Pressed Metal Engineering: Some Principles and Examples," by Douglas P. Cook, president Boston Pressed Metal Co., Worcester, at the machine shop practice session of the annual meeting of the American Society of Mechanical Engineers, held Dec. 6, in New York.

Mr. Cook's paper dealt more particularly with the problems of the so-called jobbing pressed metal industry. The fundamental causes and supplementary conditions affecting the status of the industry and handicapping the adoption of a policy of sales expansion into relatively undeveloped fields were vividly outlined. The importance of the engineering function and the key position of the sales engineer in extending the market for the products of the industry were emphatically brought out. In addition, Mr. Cook's paper was felt to present to those not in the industry a forceful sales talk on the possibilities of economies in the employment of pressed metal parts to their own devices.

At the outset it was pointed out that there was no mechanical field of equivalent scope and importance that so much needs and will so richly repay unsparing critical analysis of its present status and conditions as what has come to be known as the pressed metal industry.

Producing Groups Classified

"Broadly speaking," said Mr. Cook, "a thorough study of the application of press processes would cover three general producing groups, the so-called jobbing industry, comprising those plants that manufacture special pressed metal parts to order; the several distinct groups that have gradually evolved as a result of intense specialization of the press process, and the scattered field of independent manufacturers of other than purely press products, who often devise and employ the most unusual and striking exemplifications of the process. In addition there is the collateral field of pressed metal equipment, the field of raw material, the detailed study of technical methods of production in the industry itself, tool and machine design, and the collateral processes of annealing, heat-treating, machining and finishing. This, it was stated, is the general scope of the field of "pressed-metal engineering," a term not yet in general use, and a field that even today lies almost unexplored.

Of these producing groups, the so-called "jobbing" pressed metal industry was said to be made up of about 75 major plants and about 300 minor ones, if all be included who solicit press work whatever their principal line, with an annual volume of probably 40 to 50 million dollars. It is legitimate therefore, he said, to call this a major industry, for such it ranks in the importance of its service even though, because of its peculiar character, it is difficult, to determine its exact membership or annual turnover, with accuracy.

A major claim to interest in the pressed metal process was pointed out to lie in its wide diversity of application, with the result that no individual or particular group can be said to be abreast of its progress. The flexibility of application of the process, which has pervaded hundreds of industries in countless forms, while exceedingly valuable to industry at large, was emphasized as containing both advantages and disadvantages to the jobbing industry. The relatively rapid growth of the industry was stressed, this growth being said to be also uneven and almost uncontrolled.

"It was left primarily to the jobbing industry alone," said Mr. Cook, "unaided by the usual benefits of organization or by the cooperation of collateral interests, to discover new fields and applications for the process, new outlets and markets for its products. It is the comparative failure of the industry as a whole adequately to solve this problem that has caused several existing conditions that must be remedied before the industry can fully come into its own."

Decentralized Growth of Industry Unfavorable

A fundamental cause contributing "to what might almost be termed the lethargy of the industry in seeking to extend and stabilize its market," was said to be "in reality—inherent in the peculiar empirical and individualistic method by which the industry reached its present stage." Other important causes given were the contemporaneous growth of the automotive industry, and the effect of the war on the industry.

"Tracing from early stages the actual growth of the mechanical knowledge, which developed, without concentration or orderly dissemination," said Mr. Cook, "we find that when a few original companies had accumulated knowledge and facility in handling the new process, practical mechanics, tool makers and foremen split off to form new companies. In these the same process would be repeated, slowly acquiring a store of practical knowledge that would in turn be split off and conveyed to another center of growth. Each remaining company continued on its way, increasing its own store of knowledge and experience, while the new companies, as rapidly as they were formed, entered new fields and developed new practices, based on their original accumulation of knowledge.

"Actually, of course, the operation of this simile was controlled and regulated to a degree by the normal interchange and adjustments of every-day business, but the deduction is inescapable that owing to this particular method of development there was a constant tendency toward the partitioning of new knowledge of the developing art, which resulted in a constant decentralizing of important, even indispensable, information.

"As a natural result of this tendency, the comparative progress of the various specialty companies was uneven and unbalanced. Some rapidly placed themselves in position to perform original redevelopment or redesigning work and to handle various unique problems of economical, interchangeable, quantity production, while some could not, and did not even pretend to achieve any one of these things."

It was also pointed out as worthy of note that the individuals forming new centers of growth were in many cases the practical or administrative mechanics of the relinquished organization, men untrained in the field of management, accounting, production control, and the modern principles of selling so that the growth of the new companies was sometimes slow and difficult until the necessary managing and sales experience had been accumulated or finally provided for by the addition of that type of personnel, after which rapid and comparatively safe progress became possible.

Another check on general growth was said to be that here and there able and efficient companies had pioneered into a new field, established themselves therein with a standard production and withdrew from the jobbing or specialty group, thereafter abandoning original or development work, except as it contributed alone to their own particular field of production.

In addition to these main inherent tendencies result-

ing in uneven and retarded progress, the confusion was still worse, it was said, because the effective growth of the industry has occurred mainly within the last 15 years, a period of intense effort resulting in a tremendous burst of redevelopment of processes, methods and equipment, occasioned by the demands of automotive design and production. The automotive industry, it was stated, absorbed an important proportion of the free and constantly expanding press capacity of the country and supplied in return the principal impetus for the rapid growth of methods and equipment. The effect upon both industries was said to be practically revolutionary. The pressed metal industry opened suddenly to the automotive engineer a limitless field, still but half explored.

"Upon the smaller pressed metal industry, the effect was still more impressive and important. The intense pressure of the automotive demand tended to prevent the creation or growth of any self consciousness and resulting cooperative spirit in the industry as such. It was too intensely occupied with its efforts to meet the immediate and broadening situation, with the inevitable result that its attention was almost exclusively centered upon the customer industry whose demands were most immediate and insistent, with only occasional and spasmodic efforts to apply to the needs of all other industries the knowledge and ability produced by having served the one to the full extent of its insistent demand."

Influence of War Period

"The war effort of the industry, a fascinating study in itself," said Mr. Cook, "only exaggerated and intensified these conditions, and the receding wave of its exigent demands lent force to the already logical pressure and economic certainty that the industry must now accept its opportunity to broaden its fields and markets by intensive effort into industries comparativly undeveloped."

It was given as his belief that if all potential customer industries had been assisted in their development proportionately to the automotive there would today be little difficulty for a jobbing industry double the size of the present to support itself. The same assertion would hold good, he said, if, in the near future, pressed metal might be introduced into all other possible customer industries in the same proportion of feasible application as it has into the automotive industry today.

"The road from the pressed metal industry to the automotive plant and back is broad and well traveled," said Mr. Cook. "Relatively the approaches to hundreds of other potential customer industries are but vague and unbroken foot paths. In this condition lies not only the great present opportunity of the industry, but a coming demand for a new type of highly trained engineer to do an indispensable work."

Supplementary Conditions Handicap Expansion

Supplementary to the major causes of the failure to expand the possibilities of the industry there are, he said, a number of general conditions that affect its status and seriously handicap its efforts to adopt the logical and seemingly imperative policy of sales expansion into relatively undeveloped industries.

Among the handicaps cited was the lack of popular or general recognition of the large contribution made by the industry to modern civilization, resulting in absence of consumer interest and support. Another was the failure of the industry to develop engineering standards or to publish adequate technical information for the assistance and guidance of possible customers.

It was stated that to a great extent the industry has been content to sit back and await customer inquiries, The losses caused by acceptances of customers' engineering were outlined, and in this connection Mr. Cook said: "Not informed as to all the possibilities of the situation, the customer may request quotations on some crude original design, which perhaps may take but a fraction of the advantages of design or function that would have been disclosed by proper analysis and expert consultation. Such inquiries also often contain the theoretical and useless specifications of tolerance, the attainment of which adds unnecessarily to production costs and the large total of actual loss entailed by the lack of proper sales engineering investigation. In such cases, too, the time and expense of preparing estimates and quotations is wasted.

"The time is here when the alert manufacturer will call as freely and promptly upon his pressed metal engineer to consult on problems of design and construction as for years he has called upon other branches of the engineering profession. Also the day is here when fewer companies care to quote blindly to a blueprint calling for limits of 0.0005 in. variation, nor on designs whose functions or specifications or use they have little or no knowledge.

Separating Engineering and Production Functions

"The expansion of sales engineering in the industry will in time remedy another and related handicap, the lack of definition and separation of the functions of engineering and of production. Originally there was no acknowledgment of the necessity of any engineering. A sample or sketch was submitted to the 'practical' man of the organization, who proceeded to make it. The usual customer regards the purchasing of pressed metal parts purely as a matter of competitive selection on a basis of price or first cost. If he knew the real facts, he would realize that apart from first cost there is great difference in the engineering service that he may receive, and that his selection should be guided by that fact and by the scrutiny of ultimate cost and economy." That the work of the pressed metal sales engineer is not only to be recognized but will be demanded and willingly remunerated by the customer as the primary essential to successful production was a belief expressed.

The question of ownership and removability of tools was also said to be a handicap. On this Mr. Cook stated: "It is demonstrable to a fair-minded customer that in paying a preliminary 'tool charge' or 'tool expense' or 'cost of tools' he is not thereby purchasing a physical asset, removable or transferable to his order. He is in effect purchasing primarily a service covering not alone the physical construction of the tools, but also the necessary preliminary work involved in redesign and redevelopment and the actual designing of the tools; and that his payment of such a charge is but his proper contribution for the services and toward the maintenance of an organization competent to perform the specialized character of work required."

Another hindrance to extensive redevelopment work mentioned was the difficulty of protecting exceptionally successful redevelopments, many of which represent nothing patentable either in process or result, but which nevertheless represent distinct and often valuable improvements over current practice.

Advocates Individual and Cooperative Research

That the greatest rewards of the next decade will accrue to those that develop with greatest intensity the waiting field of redevelopment, was emphasized, and it was pointed out that there has begun in the industry an intensive search for articles and parts that can be advantageously redeveloped. This work, it was indicated, will probably be carried on both cooperatively and individually by separate companies. It was brought out that a group in the industry, the Pressed Metal Trade Extension Council, has been supporting for some months a modest campaign of national advertising, aimed to draw out suggestions for possible redesign. The early results of this were said to have elicited hundreds of suggestions. Similar search by individual companies is already routine daily work, but on the whole it is spasmodic. Both the cooperative and individual research should be reinforced, said Mr. Cook, by persistent advertising, publishing specific economies obtained and emphasizing possibilities of further application.

Establishment of engineering standards for the industry was regarded as imperative, and also making available scientific investigation of qualities of materials most suitable for specific operations and results. Publicity to stimulate a broad consumer interest and demand was also emphasized as necessary.

(*Concluded on page* 1625)

Strip Mill Designed for Ease of Control

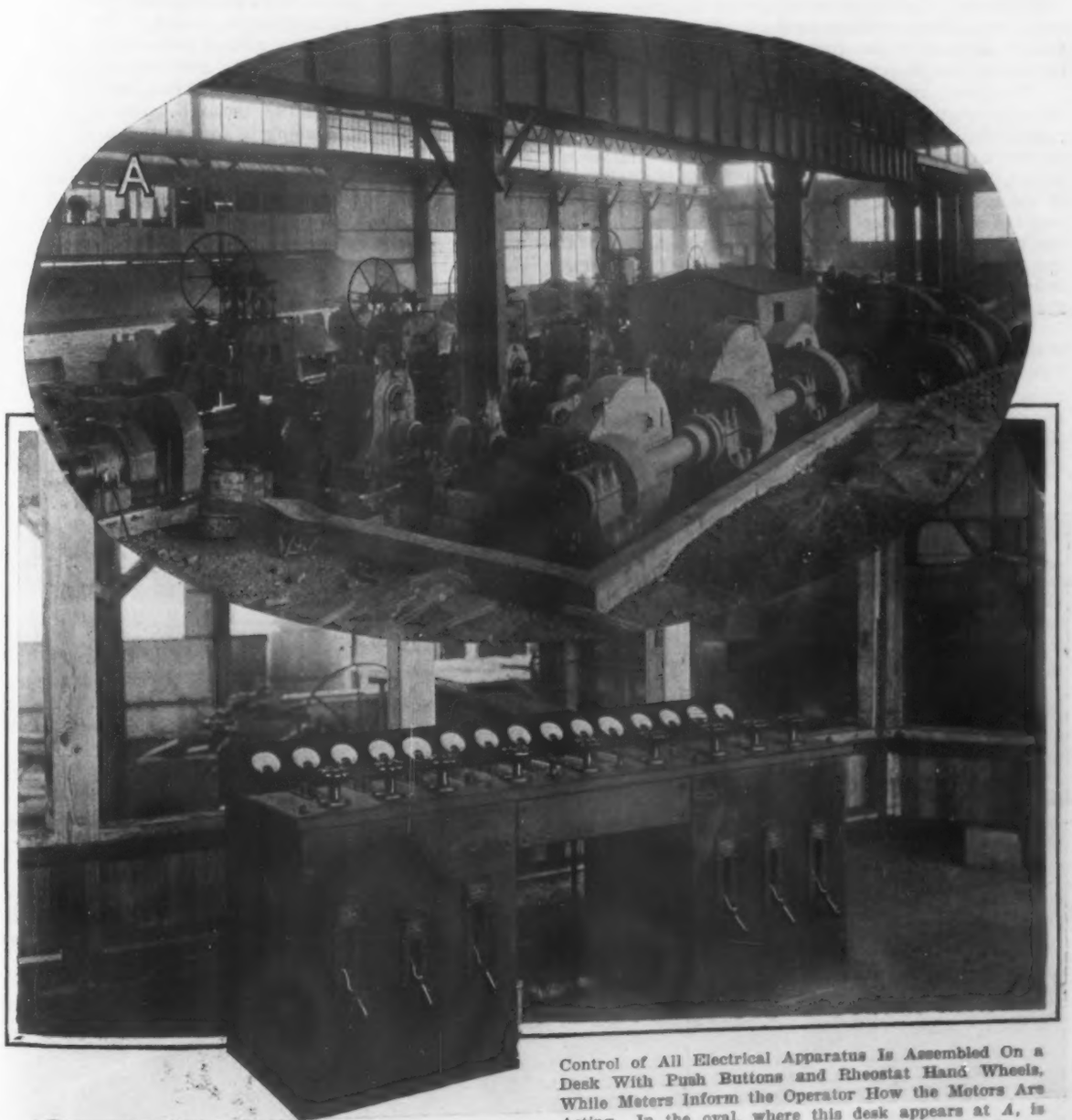
Arrangement of Thirteen Stands in Two Parallel Rows and Completeness of Motor Drive Are Features

THOROUGHLY representative of the latest thought in mills of its class, a new 20-16-in. strip mill recently has been completed and placed in operation by the West Leechburg Steel Co., Leechburg, Pa. It means not only that the company can now boast of a mill second to none in the country in point of efficiency and capacity but, as it supplements 12-in. and 9-in. units, it also means that the range of sizes produced by the company is widened.

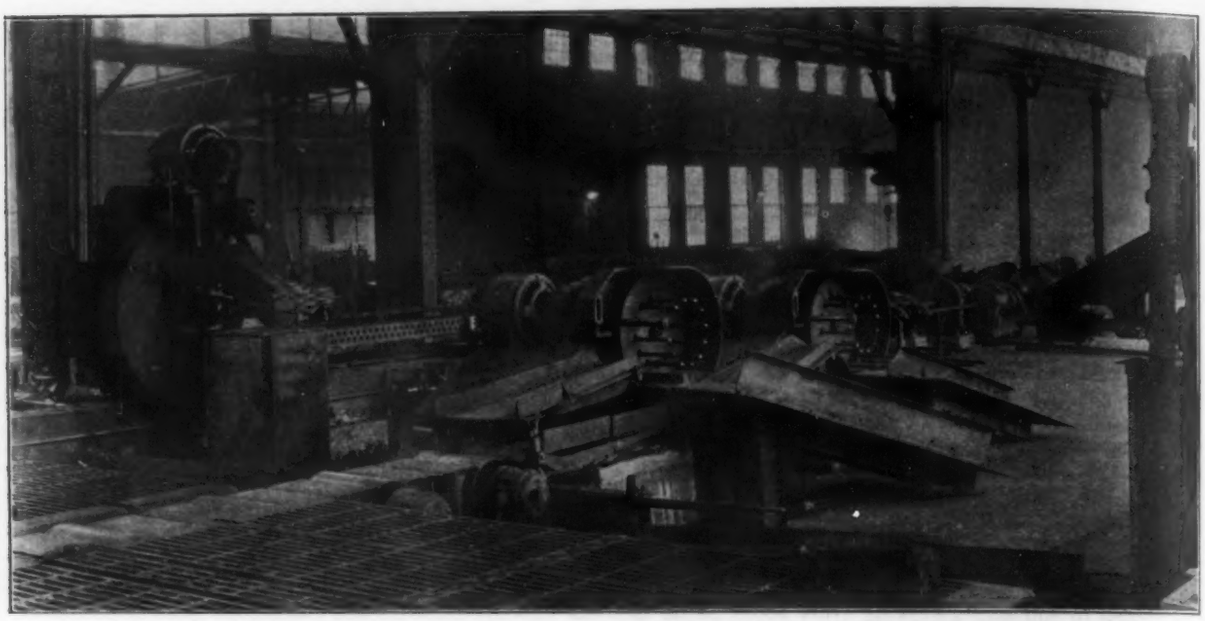
Hitherto, this company has not done much in the wider material, which finds heavy use by the automotive industry for underframes, brake drums and fenders; the new mill permits it to enter that field. The mill is designed to roll strips varying from about 18 in. to 6 in. in width and ¼ in. and lighter in thickness, in either coils or cut lengths. As the 9 in. mill rolls material as narrow as ¾ in. in width, the full range of sizes now is from 18 in. down to ¾ in. and in practically any thickness required. Electrically driven throughout, the new mill in early tests completed the cycle from the slab to the coiled strip in less than a minute. The mill buildings are spacious and the facilities for handling material entirely modern. As the rolling mills are largely automatic costs should run low.

The section of the building containing the mill proper is 660 ft. long. This permits of storage and loading space, as well as for the generator and motor room for driving the last four stands of rolls of the finishing mills. A removable roof over the portion of the room occupied by the direct-current motors allows them to be handled by the mill crane. Another section of the building contains the continuous gravity discharge type furnaces, billet and finished steel storage space, pickling shop, bundled room and shipping shed.

The two furnaces, built by Alexander Laughlin Co., Pittsburgh, are producer gas-fired and are served by



Control of All Electrical Apparatus Is Assembled On a Desk With Push Buttons and Rheostat Hand Wheels, While Meters Inform the Operator How the Motors Are Acting. In the oval, where this desk appears at *A*, is shown the group of drives for the roughing mill



Reels Can Be Operated Singly or Doubly. The use of the skid permits directing the strips alternately to the two reels. At left is one of the shears; the other is mostly off the cut, at right

motor-driven below-floor type pushers of heavy, rugged construction. Cold slabs are conveyed by magnet crane from the adjacent storage yard and placed on the pushers at the rear of the furnace. The charging is done largely by one man seated at the motor control.

The 20-in. roughing mill contains seven stands of rolls in a continuous line. The first and fourth are horizontal edging stands; the sixth a vertical edger and the second, third, fifth and seventh stands are flattening passes. Located between the furnaces and the first pass of the roughing mill is a horizontal slab shear for cutting hot slabs. A steel rope transfer table, which shifts the hot bar from the last pass of the roughing mill to the first pass of the finishing mill, will if so desired deliver the piece upside down. It is operated by a 20-hp. 230-volt series motor.

The 16-in. finishing mill contains six stands of rolls, also in a continuous line, all of which are flat passes. The arrangement of the finishing mills is such that one strip of hot steel may be in two, three or four passes at the same time, the last four stands of mills being quite close together. As the hot strip leaves the final pass of the finishing mill it is conveyed by a roller runout table to the double hot bed for shearing or to the two winding reels, depending upon whether the steel is to be cut to lengths or coiled. The winding reels are at the end of the runout table delivering the steel from the finishing stands and can be operated singly or both at the same time. When both reels are used, the first strip coming through goes to the reel farthest from the finishing stand and the second is introduced to the first reel by the lowering of a skid.

If the steel is to be cut to length a motor-driven kick-off pushes the strip off the runout table to one side or the other, onto the double hot bed, to cool. Ratchet and shuffle bar conveyors deliver steel onto roller tables to be conveyed to finishing shears and thence to piling tables for final disposition.

The mill machinery, all of which was furnished by the Treadwell Engineering Co., Easton, Pa., and the Birdsboro Foundry & Machine Co., Birdsboro, Pa., involves many new features of construction. All mill housings are of steel. Gearing is all of cut steel inclosed in suitable covers to permit running in a lubricant. Mill roller tables are motor-driven and the gears are encased in a box-shaped section which is oil tight.

Partial View of the Roughing and Finishing Mills with Steel in Process. In left foreground is the roof of the motor room

All bearings are of babbitt shell and ring oiling type, except hot bed center runout table, which is of a special design, having each roller driven by a ½-hp. induction motor. Each roller and motor is provided with three ball bearings.

Both the mill proper and all auxiliary apparatus are motor driven. Numbers 1, 2, 3, 4, 5 and 7 stands are driven by one 1500-hp. 3-phase, 2200-volt a.c. motor through a Falk reduction gear set. The countershaft runs at 705 r.p.m. As the distance between passes is such that the hot strip is never in two of these passes simultaneously, no attempt is made to obtain speed adjustment or close speed regulation during the roughing passes. Flywheels are provided, however, with liquid-type automatic slip regulators, to relieve the motor of heavy load peaks.

Stand No. 6 is a vertical edger between stands 5 and 7 and is located close to the latter. For this reason its speed must be adjusted closely with respect to that of stand No. 7, and hence it is individually driven by a 100-hp., 230-volt, compound direct-current motor with an adjustable speed range from 400 to 800 r.p.m.

Stands Nos. 8 and 9 are geared to a shaft which is driven by a 1500-hp. induction motor with flywheels and a slip regulator, similar to the one which drives the first group of roughing stands.

By the time the strip reaches the intermediate stands Nos. 10 and 11 its length has become great enough so that it will pass through two or more of the succeeding stands simultaneously. This means that the speed of these successive stands must be increased in proportion to the elongation, and also that the relative speeds of the stands must be maintained very closely, to avoid either breaking the strip or excessive looping. For this reasons stands Nos. 10 and 11 are individually driven by direct-connected 1500-hp., 240-volt, 125 to 250 r.p.m. compound direct-current motors.

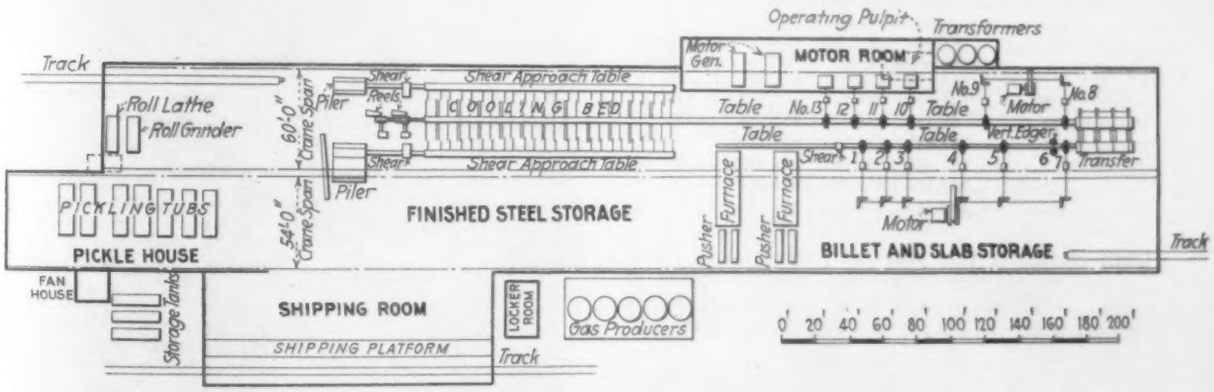
Finishing stands Nos. 12 and 13 are direct connected to 1800-hp., 240-volt, 165 to 350 r.p.m. compound motors. These motors are controlled without automatic speed regulation of any type, the exceedingly close speed regulation being obtained by careful design of the compensating windings and series coils, etc., of the motors and the generators which supply them with power. Two 2000-kw. motor-generator sets are used for supplying current to the d.c. mills and auxiliary motors.

The design of the d.c. finishing mill motors is of special interest, inasmuch as extremely close speed regulation is maintained, regardless of loads or set speeds. The speed regulation of these motors is inherent in their design and no external methods are needed to maintain the very necessary close speed regulation required in the last four continuous stands.

Control of all electrical apparatus is in a gallery centrally located, commanding a view of the entire mill. The control is assembled on a desk, with push buttons and rheostat hand wheels on the flat top, for regulation of the machines, and back of these on an inclined panel are the meters. The field switches are located at either side of the front desk. Ease of control is facilitated by the arrangement of the roll stands in the two parallel rows, all within view from the control pulpit.

The Westinghouse Electric & Mfg. Co. furnished and installed the motor-generator sets, mill motors, switchboards and auxiliary apparatus. Three-phase power is supplied by the West Penn Power Co. at 22,000 volts, through transformers built by the Pittsburgh Transformer Co., having a capacity of 10,000 kva. at 2300 volts, secondary. Direct current generated at 250 volts is used on all direct current apparatus.

The buildings were erected by the Bollinger Andrews Construction Co., Pittsburgh. The foundations under mills and motors are unusually massive, and were installed by the Colonial Construction Co., Pittsburgh.



General Layout of the New Strip Mill, Showing Conservation of Space and Building Cost by Running the Steel Back, in the Finishing Mill, Parallel to Its Course in the Roughing Mill

Melting of Sponge Iron

Experimental work on the production of foundry iron from sponge iron in the electric furnace, performed by the Seattle station of the Bureau of Mines, demonstrated that technically, at least, the process is a success, though large-scale tests are necessary to determine its commerical applicability. Such a process would find application in melting iron in regions remote from blast furnaces, or where establishment of blast furnaces would be impracticable. Sponge iron was melted in batch runs and continuous runs, in various types of furnaces, and under both acid and basic conditions.

The type of furnace found best fitted for the continuous melting of sponge iron is a deep pit furnace with a single electrode and a conducting hearth. The main problems solved were: High recovery of iron, clean separation of the slag, obtaining metal of a high-carbon content, introduction to the metal of silicon and manganese from the slag to eliminate the necessity of using ferroalloys, and, finally, the removal of sulphur. In order to produce the best quality of gray iron, an auxiliary furnace would be necessary to adjust the final composition of the metal.

The Detroit-Ann Arbor section of the American Institute of Electrical Engineers held its monthly meeting, Dec. 7, in the Detroit Edison service building, 2000 Second Avenue, Detroit. Prof. Vladimir Karapetoff, of Cornell University, was the speaker of the evening, demonstrating Einstein's theory of relativity by means of a model which is regarded as a successful attempt to bring this theory to the level of general understanding.

For the fourth consecutive month, employment fell off in Cleveland in November, according to the report of the labor relations committee of the Cleveland Chamber of Commerce. During last month, 98 companies employing 500 or more persons laid off 2548 of their employees. Fifteen companies reported that their working forces would be decreased in December and 12 announced that further reductions would be made.

FERROMANGANESE SUPPLIES

Large Output This Year—Available Supply for 1923 Ample—Spiegeleisen Next to the Record—Ore Imports at Low Ebb

From returns already collected by THE IRON AGE, showing the output of American blast furnaces, it is probable that, while the production of ferromanganese and spiegeleisen in 1923 will not establish a record, the output for the year will rank in third place in the last 10 years. The largest output of both these alloys was in 1918, the last year of the war, and the record for any peace year in the last 10 years was in 1920. This year's production of ferromanganese will, without doubt, rank next to 1920 and 1918.

From present indications the ferromanganese output of the country for 1923 will be close to 240,000 gross tons, and that of spiegeleisen at least 130,000 tons. If spiegeleisen attains this volume this year it will be the largest output for any peace year in the last ten.

The following table gives the production of ferromanganese and spiegeleisen thus far this year compared with the record for certain previous years:

Ferromanganese and Spiegeleisen Output of the United States in Gross Tons

	Ferro-manganese	Spiegel-eisen	Total	Average per Month
To Nov. 1, 1923..	213,323	103,678	317,001	31,700
Total, 1922.....	151,175	68,587	219,762	18,313
Total, 1921.....	98,439	56,139	154,578	12,881
Total, 1920.....	282,681	103,448	386,129	32,177
Total, 1919.....	179,029	65,391	244,470	20,732
Total, 1918.....	345,306	249,002	594,308	49,525
Total, 1913.....	119,495	126,081	245,576	20,464
November, 1923..	14,839	16,783	31,622	.....

Until November this year the production of ferromanganese maintained an average monthly output of 21,330 tons, but there was a decided falling off in November, when the output was only 14,839 tons.

Available Supplies

The available supplies of ferromanganese thus far this year and for previous years as obtained from an analysis of the output, imports and exports are shown in the following table in gross tons:

Ferromanganese Output, Imports and Exports, and Available Supplies in Gross Tons per Month

	Output	Imports	Exports	Available Supplies
To Nov. 1, 1923...	21,332	8,245	362	29,215
1922	12,598	7,882	92	20,398
1921	8,203	755	57	8,901
1920	23,557	4,941	288	28,210
1919	14,923	2,752	255	17,420
1918	28,775	2,264	298	30,741
1917	21,486	3,703	*776	25,413
1916	17,365	7,577	...	.....
1915	12,021	4,605	...	.....
1913	9,958	10,672	...	.....
1911	6,207	6,688	...	12,895
5-yr. (1910-14)...	8,280	8,399	...	.....

*First half only.

The most interesting feature of the above table is that the importations of ferromanganese this year will establish a record for any year since 1913. At 8245 tons per month they are larger than in 1922, when the inflow was heavy, due to the imposition of a tariff late in the year, but rather below the record imports of 1913, when they were 10,672 tons per month, and when British ferromanganese constituted about 50 per cent of the total consumption of this alloy by the American steel industry. Thus far this year the same figures show that the available supplies of 29,215 tons per month are the largest for any normal year, and are close to the available supplies of 30,741 tons per month in 1918, the last year of the war.

Supplies of Manganese Ore

Probably the most interesting feature of an analysis of the manganese supply of the American industry this year is the phenomenally low rate of importation of manganese ore in 1923. To Nov. 1 this year only 179,255 tons had been imported, or 17,925 tons per month. The import statistics for the last 10 years are shown in the following table:

Manganese Ore Imports into the United States in Gross Tons

	Total	Average per Month
To Nov. 1, 1923.....	179,255	17,925
Total, 1922	374,451	31,204
Total, 1921	401,354	33,446
Total, 1920	606,937	50,578
Total, 1919	332,344	27,779
Total, 1918	491,303	40,942
Total, 1917	629,972	52,498
Total, 1916	576,324	48,027
Total, 1915	320,784	26,732
Total, 1914	283,294	23,608
Total, 1913	345,084	28,757

These data show that 1923 will establish a record for low imports of this important alloy in the last 11 years. The contrast between this year and previous years is a striking one. From these figures it is difficult to appreciate how so large an output of ferromanganese could be made this year with importations so low, but it is probably true that sufficient stocks of ore in the hands of ferromanganese producers have existed this year to account for the apparent discrepancy. The importations of 17,925 tons of ore per month this year contrast with the next lowest figure of 26,732 tons per month in 1915 and with the record of 50,578 tons per month in 1920.

British Ore Supplies

In strong contrast to the American receipts of manganese ore are those of the British as shown by the following table:

British Imports of Manganese Ore

	Total	Average per Month
To Nov. 1, 1923.....	454,265	45,426
Total, 1922	337,312	28,109
Total, 1921	172,856	14,405
Total, 1920	452,613	37,718
Total, 1919	265,800	22,150
Total, 1918	365,606	30,467
Total, 1917	331,264	27,605
Total, 1916	439,509	36,625
Total, 1915	377,324	31,443
Total, 1914	479,435	39,953
Total, 1913	601,177	50,098

These figures show that for the first 10 months of this year British manganese ore receipts had averaged 45,426 tons per month, which is next to the record receipts in the last 10 years, or 50,098 tons per month in 1913. The present rate of imports exceed any record during the war when steel output was considerably larger than at the present time.

Contrasting the situation in the two countries, it seems evident that British makers of ferromanganese have carried very few stocks from year to year, while American producers must have had, early in 1923, at least 300,000 tons of manganese ore in stock. It is hardly probable that this quantity, without which the present output of ferromanganese could not be made, should be coming from American mines.

Supplies and Needs in 1923

Not long after the United States entered the war it was officially estimated that the monthly needs of the steel industry were 28,000 tons of ferromanganese. This was based on the use of 80 per cent alloy and a steel output of about 43,000,000 gross tons. In THE IRON AGE of May 13, 1920, it was estimated that with a steel production of ingots and castings of 45,000,000 about 316,000 tons of ferromanganese would be theoretically necessary. The 1923 production of steel, based on official reports thus far this year, is at the rate of about 45,000,000 gross tons. Assuming that the ferromanganese output this year will approximate 240,000 tons and that the imports at the present rate will total roughly 99,000 tons, then the combined available supplies, exclusive of exports, will be 339,000 tons. With the theoretical needs of the steel industry calling for 316,000 tons of ferromanganese, the apparent available supplies for the year (approximately 339,000 tons) are ample. These conclusions are sustained by the present state of the market in which prices are easy and the alloy plentiful.

Soderberg Self-Baking Electrodes

Use in Carbide and Ferroalloy Furnaces in Europe—Advantages of Their Application to Electric Steel

BY FRANK HODSON*

THE student of steel making who in 1913 predicted there would be over 400 electric furnaces operating in the United States in 1923 was indeed endowed with the gift of prophecy. If there was any such student, which we are inclined to doubt, he was probably regarded as an unbalanced enthusiast.

Today a somewhat similar divergence of opinion exists in many quarters. Many observers, impressed

20-Inch Soderberg Electrode in a 3-Ton Heroult Furnace at Stavanger, Norway

by the magnitude of temporary obstacles and impatient for speedy results, consider that progress has reached its limit in certain directions. A minority recognizing the broad trend of the times, with the chain of results that will follow, preserve the faith that we are merely at the beginning of electric furnace developments of far-reaching scope. The writer is bold enough to predict that in a few years, with the coming of cheaper power, no modern steel works will be complete without the final finishing of metal in electric furnaces.

Several plants abroad are already using with considerable success a process consisting of blast furnace metal to metal mixers, metal mixers to Bessemer, and Bessemer to electric furnaces—eliminating entirely the open-hearth furnace. Cheap steel of high quality and uniformity can be produced by this process at a cost comparable with the cheapest production methods now in vogue. The amount and cost of electricity used is quite small and the introduction of the self-baking electrode, developed in Norway under the name Soderberg, not only will cheapen refining costs, but will render possible the design and operation of electric furnaces of very much larger capacity than any existing furnaces.

The Soderberg electrode is widely used in Europe in electrothermic industries. It has demonstrated its value in tilting electric steel furnaces and will also be a contributing factor toward cheaper electric steel. This method of forming the electrode in the same furnace in which it is used was at first frowned upon. With the improved understanding that has come from experience, the technical problem of the self-baking electrode has been solved. Numerous carbide and ferroalloy furnaces in Norway, Sweden, and Germany have been enjoying the savings which the continuous self-baking method makes possible, for several years past. The Mitsui Co. recently purchased the rights for Japan and is using Soderberg's in carbide furnaces, totaling more than 60,000 kw. capacity. In France, Italy, and South Africa, plants are now in operation using this method.

The experience gained in open furnaces of the carbide type has now been utilized for the benefit of the steel maker. In adapting the Soderberg electrode

Heroult Furnace Equipped With Soderberg Electrodes at Stavanger, Norway

to the tilting furnace, the overhead tamping room has been done away with and the joining up of the electrode is done outside the furnace. The method used is simple and efficient and has been used at Stavanger, Norway, and Remscheid, Germany, for over a year. Data on the Stavanger installation are now available. A description of the methods and results used in the two Soderberg-equipped steel furnaces at Remscheid

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will appear in *Stahl und Eisen* in December. Two installations in French and Italian furnaces are operating smoothly. The equipping of the 20-ton Greaves-Etchells furnaces at Domnarvet, Sweden, has been delayed by a strike.

For the moderate sized furnace the Soderberg electrode will assist the steel maker in his efforts to reduce costs. Lower first cost, lower consumption of electrode owing to absence of oxidation, and the regular operation rendered possible by freedom from breakages will result in cheaper steel.

For large furnaces the Soderberg system opens up an inviting field. The success of the 40-in. electrode has been demonstrated and diameters of 70 or even 100 in. are probable. This makes possible simple furnace designs using three, four, or more electrodes, the only limit in size being mechanical design and present day refractories. Such furnaces could either be fixed furnaces, built on open-hearth lines, or tilting furnaces. Satisfactory results have already been obtained at the Ford electric furnace plant at River Rouge, on blast furnace iron superheated in Greaves-Etchells electric furnaces. It is quite conceivable that, by use of the Soderberg electrode, electric furnaces of up to 500 tons capacity can be economically operated for superheating iron or steel. Such furnaces might consist of a row of Soderberg electrodes and could pour their superheated metal continuously.

It is not to be denied that there are some problems in connection with refractories whose solution would contribute greatly to electric furnace development. Already from certain quarters, where excellent research is under way, comes hopeful news. Nor is the writer unmindful of the large investments involved in present steel plants. Revolution is not predicted or desired. The measuring unit of progress must be the 5-year span rather than the single year. But the fact remains that the answer to the cry for cheaper steel and better steel is cheap power and the large economical electric furnace unit. Progress on a half dozen engineering sciences is converging to place these elements at the disposal of the steel maker.

Pittsburgh Base Abandoned by Chicago Maker of Cold Finished Steel Bars

CHICAGO, Dec. 8.—In an announcement made here this week, the LaSalle Steel Co., Chicago, manufacturer of cold-drawn steel bars and shafting, inaugurated a Chicago mill base on its products. It is now quoting cold-finished steel bars and shafting at 3c. base, f.o.b. Chicago district mill, instead of at 3c., base Pittsburgh. In commenting on the move, C. D. Kelly, vice-president of the company, said:

"We took this action believing that it was justifiable in every way and that the tonnage consumed and produced in this territory fully warranted the establishment of a Chicago base on our products. It is our belief that the increased sales possibilities of consumers throughout this district by reason of the enlarged territory in which they can compete with the Eastern manufacturers on an even footing, will react to their benefit and correspondingly to the benefit of the Chicago producers."

The plant of the LaSalle company at Hammond, Ind., has a capacity of 75,000 tons a year. Its output is used extensively in the automobile industry, as well as by manufacturers of agricultural implements and machinery. The establishment of a Chicago base gives the company an advantage of 40c. per ton at Detroit over Pittsburgh district competitors, the freight to Detroit from Chicago being that much lower than from Pittsburgh.

The inauguration of a Chicago base on cold-finished steel bars follows the establishment of a Chicago base on plates, shapes and bars two years ago. During most of that time, however, Chicago base prices on those products have averaged $2 a ton higher than Pittsburgh base quotations. The new Chicago base price on cold-finished steel, however, is exactly the same as that at Pittsburgh.

Synthetic Foundry Iron

The feasibility of producing a good grade of foundry iron from steel scrap in the electric furnace has been demonstrated in experimental work performed at the Northwest experiment station of the Bureau of Mines at Seattle, Wash. This development permits any manufacturing plant to use all its iron scrap on the spot in making castings equal to if not better than those from cupola iron. Improved methods of charging the 300-lb. experimental furnace used by the bureau gave more rapid carburization, and carbon contents as high as 5 per cent were reached. Several heats were made in a 1-ton commercial electric furnace of the Heroult type, at Hoquiam, Wash., and in a 1-ton indirect-arc, rocking furnace in a foundry at Detroit, Mich. In every case, these tests were successful in producing sound, strong gray iron from steel scrap and iron turnings.

Secretary Hoover's Comment on Increase of Iron and Steel Exports

WASHINGTON, Dec. 11.—Secretary Hoover in his annual report says:

"The iron and steel division has pointed out some of the weak spots in the conduct of American export trade and has recommended correctives. It has urged manufacturers to seek export trade when business at home is good. Promising markets were indicated. The attention of the industry was called to the disadvantages resulting from the necessity of transshipping goods in foreign bottoms in order to reach certain foreign ports. There was an extraordinary growth in the number of inquiries answered. A steel exporters' index was started and grew rapidly. The chief of the division, Luther Becker, made frequent visits to the leading centers. A world-wide investigation of the market for industrial structural steel buildings was carried out. Data involving the manufacture abroad of iron, steel, and copper wire were collected. An investigation was made in European countries to ascertain the character and extent of 'redevelopment' work in sheet and pressed metal. Other studies concerned wire rope, special steels, roofing materials, forgings, steel castings, sprocket chain, etc. The division has been instrumental in selecting proper foreign agencies for American manufacturers."

Contact has been established with 51 trade associations having to do with iron and steel and their products.

Brazil's Steel Industry

The Companhia Siderurgica Belgo Mineiro, of Sabara, Minas Geraes, Brazil, has been granted special concessions for a term of 40 years, says the London *Ironmonger*. The company has one blast furnace at work and intends to erect another, as well as an open-hearth furnace and two rolling mills. The Companhia Electro-Metallurgica, of Ribeirao Preto, in the State of Sao Paulo, reports a production for the first half of 1923 of 1382 tons of electric pig iron and 2561 tons of steel from Bessemer converter and electric furnaces.

Open-hearth plants of the steel works in the Cincinnati district are now employed at about 55 per cent of capacity. Finishing mills are running approximately 70 per cent. It is expected this rate of operations will be maintained during the remainder of the year. Three steel company blast furnaces are in operation, as are two silvery furnaces in Jackson County and one foundry iron producer at Ironton.

MICHAEL PUPIN

Pupin's Contribution to a Great Cause

In the conclusion of his autobiography, Pupin says:

"Ideal democracy, if attainable at all, will certainly be attainable in our country, whose traditions are gradually eliminating racial hatreds and suspicions and making them unknown human passions on this blessed continent. If I have contributed anything substantial to the progress of this splendid movement, whether as an immigrant or as an inventor, it has been most amply rewarded by the spirit of the letter (one written by President Harding in appreciation of Professor Pupin's work on the National Advisory Committee for Aeronautics) written by a man whom I had the honor of knowing personally and who to me always represented the ideal American."

From Immigrant to Inventor. By Michael Pupin (pronounced Pyupeen with accent on last syllable.) 396 pages, 6 x 9 in.; illustrated. Published by Charles Scribner's Sons. $4.

IF it is true, as someone has said, that the tests of a great book are great thought, great style and a great soul expressing itself through the book, then the autobiography of Michael Pupin, professor of electro-mechanics, Columbia University, "From Immigrant to Inventor," is such a book. Any intelligent reader of this fascinating adventure in democracy and science will be convinced of this fact. Readers of THE IRON AGE will be interested in the book because of Professor Pupin's research in the subject of the magnetization of iron and also on account of his inventions, which have so wonderfully influenced long distance telephoning and the radio.

In reading the book, one's mind constantly reverts to those excellent works, Riis' "Making of an American" and Bok's "The Americanization of Edward Bok." Helpful and thought-provoking as is the latter book, as we compare it with the Pupin story, we find ourselves saying, "Professor Pupin shows the humility of a truly great man." Through all of these books, the Americanization of these men, who have contributed so much to this, their adopted country, is perhaps the most important theme.

To understand the complex civilization in which we live, we must be students of history and the best way to know history is through the lives of leading men and women; and when that story comes to us through autobiography, then we have the intimate revelation of personality and soul. After one has finished reading the Pupin book, he is a friend of Serbia and Pupin becomes his personal friend. However, "the main object of my narrative was, and still is," writes Professor Pupin in the preface, "to describe the rise of idealism in American science, and particularly in physical sciences and the related industries." The author succeeds in achieving this purpose and he does much more.

As absorbing as a work of fiction, the book tells of the boyhood of the author spent in the town of Idvor, in Banat, a section over the border from Serbia which was restless under Magyar rule, but which had to wait for the World War before deliverance could come. Schooled in Idvor, Panchevo and Prague, the immigrant boy, 16 years old, came to America in 1874, and found work as a farmer, painter and, after working as a helper in the boiler room, was promoted to assistant shipping clerk in a cracker factory. The story of the helpfulness of "Jim," the head of the boiler room, who taught Pupin his first lessons in the phenomenon of heat and—what is more important—a sound optimistic philosophy of life and that of "Bilharz," who tutored him in preparation for college, are among the unforgettable parts of this wonderful tale. The life as a student at Columbia, where through industry, innate ability, ambition and a never failing optimism, he made an enviable record not only in science but in the classics, is described most graphically. Carrying his Columbia diploma and his naturalization papers in his pocket, in the summer of 1883, he went to Cambridge and later to Berlin, to study mathematics and physics. The books of Maxwell, Faraday and Le Grange he devoured and he became the pupil and friend of Tyndall and Helmholtz. His European summers were spent in Scotland, France and Idvor. Marrying the sister of Professor Jackson, the Orientalist of Columbia University, in London, this "American by choice" sailed with

Descriptive Powers of an Inventor

THE descriptive powers of this immigrant boy who became a great inventor are shown in many paragraphs of his book as, for example, in the following, giving his experiences as a boy attending a herd of cattle: "The light of the stars, the sound of the grazing oxen and the faint strokes of the distant church-bell were messages of caution which on those dark summer nights guided our vigilance over the precious herd. These messages appealed to us like the loving words of a friendly power, without whose aid we were helpless. They were the only signs of the world's existence which dominated our consciousness as, enveloped in the darkness of night and surrounded by countless burning stars, we guarded the safety of our oxen. The rest of the world had gone out of existence; it began to reappear in our consciousness when the early dawn announced what we boys felt to be the divine command, 'Let there be light,' and the sun heralded by long white streamers began to approach the Eastern sky, and the earth gradually appeared as if by an act of creation. Every one of those mornings of 50 years ago appeared to us herdsmen to be witnessing the creation of the world—a world at first of friendly sound and light messages which made us boys feel that a divine power was protecting us and our herd, and then a real terrestrial world, when the rising sun had separated the hostile mysteries of night from the friendly realities of day."

his American bride for his adopted country in 1889 and became a teacher of mathematical physics, at Columbia University, at first conducting his research in a temporary structure, which the students called a "cow-shed."

From that time until today, the story of research and epoch-making inventions is told with all the beauty of a classical poet and with all the modesty of a great soul.

Among the marked characteristics of the book, *loyalty* is prominent. Loyalty to Idvor; loyalty to his unselfish, far-seeing mother—who could neither read nor write, but who insisted that he go on with his studies after the father's death, so that he might find out the "eternal truth"; loyalty to his adopted country and loyalty to the ideals of science.

The book also shows *deep religious feeling*, in the broadest and best meaning of that word. This Greek Catholic finds much inspiration from the sermons of Henry Ward Beecher and he is perfectly at home, as our readers know, when he speaks in the Cathedral of St. John the Divine, as he did Oct. 25 last, in appreciation of Dr. Henry Marion Howe, in the service held under the auspices of the American Iron and Steel Institute and the American Institute of Mining and Metallurgical Engineers.

The autobiography proves the author's *intense patriotism*. When a well dressed Princeton student treats the immigrant boy cordially, a deep appreciation of democratic America is developed. He is devoted to the ideals of Franklin, Lincoln, Harriet Beecher Stowe (these were his three American friends, he said, when he was examined at Castle Garden), Alexander Hamilton, ex-President Wilson and the late President Harding. He early learned the words and the meaning of the great documents of United States history.

Another outstanding feature is the *idealism* of the book. This is particularly true when he tells of the development of the National Research Council which was given $5,000,000 by the Carnegie Corporation and $1,000,000 by the Rockefeller Foundation, to encourage scientific research. The author rejoices over the accomplishments of the organization and over the near completion of its beautiful building at Washington, facing the Mall, near the Lincoln Memorial. Three ideals of men of science are emphasized (1) intellectual and spiritual discipline, (2) the cultivation of the love of the beautiful and (3) the realization that things change, but laws are immutable, immortal.

TRIBUTE TO ENGINEERS

Secretary Hoover Tells of Their Unselfish Service to the Government

WASHINGTON, Dec. 11.—Reduction in the cost of distribution is an outstanding means of bringing down the cost of living, Secretary of Commerce Herbert Hoover told the Washington Society of Engineers at its annual dinner here on Wednesday evening of last week. The most fundamental of prospects in this direction, he declared, has been the steady accretion in the reduction of cost of distribution. Sooner or later, the Secretary asserted, this problem as well as problems of a related character which have such great bearing on industry and society generally, become problems of the engineer and progress can be made only with their cooperation and that of industry. The Department of Commerce three years ago, Mr. Hoover said, entered upon a system of cooperation with engineers, industry and business generally to aid in the solution of economic problems. The engineers, it was stated, had never failed to respond to request for help.

Studies made, the Secretary said, show that the greatest waste in unemployment is due to the troughs of unemployment, and seasonal and intermittent unemployment. The work the department had done in cooperation with industries and engineers in studying the business cycle was explained by the Secretary, who said that the problem was one of unemployment and the elimination of the boom together with wasteful speculation. The great advantage in ascertaining facts regarding production, stocks, consumption and such data was dwelt upon by Secretary Hoover, who emphasized the necessity of the business man knowing these things if he is to operate intelligently and safely. He declared that three industries went through practical bankruptcy in 1920 because they were oversupplied with stocks of raw materials, but had they possessed information as to stocks, production and consumption, they would have escaped embarrassment. The Secretary declared that one authority recently stated that stability in the business and industrial world this year was due more to the information placed in the hands of the business man than anything else.

It is now necessary, the Secretary said, to eliminate the intermittance of unemployment and this was declared to involve transportation, production, and other factors, all of which were said to be problems for engineers.

"We must rely more on the engineer than correction by legislation," said Secretary Hoover. He outlined work being done under the direction of the department to do away with seasonal unemployment in the building industry, and what has been done in an effort to bring industries in tune, such as the movement of coal before the peak load is placed on the railroads in the fall for carrying crops. This year by sheer propaganda, the Secretary said, and with the assistance of engineers a closer relation between production and stocks of coal was brought about and there has not been a shortage of as much as one car during the past three months as the result.

The Secretary made it plain that he felt that the Government does not adequately reward its techincal men for their services. He declared the annual turnover of technical employment in the Department of Commerce ranges from 30 to 40 per cent because of low salaries. He said that he knew of no body of men who have given such continuity of loyal service to the Government as the technical men. It was nothing short of amazing, the Secretary said, and they often remain despite offers of much higher pay by private industry because they believe in serving the Government.

Taking up the subject of standardization work done under the direction of the Bureau of Standards, Secretary Hoover expressed the view that the determining of constants had done as much as anything in advancing the progress of science. He dwelt upon the value to private industry of the work of standardization in eliminating unnecessary types and sizes and setting up accurate specifications for the purchase of materials by the Government and which have been adopted by engineers and private industry. This has resulted in a profound economy for consumers, the Secretary said, because of lowered costs in construction and administration. The Federal Specifications Board, which is determining specifications for materials bought by the Government, it was revealed by Secretary Hoover, has from 80 to 90 per cent of its work done.

The country's building activities continued their lead over last year through November, according to F. W. Dodge Corporation. Total contracts awarded during the month in the 36 Eastern States (including about seven-eighths of the country's total construction volume) amounted to $318,828,000. Although this was a 12 per cent drop from the October figure, in 27 of these States there was an increase of 19 per cent over last November. Of last month's record 50 per cent was for residential buildings; 14 per cent for industrial buildings; 11 per cent for public works and utilities; 10 per cent for business buildings, and 8 per cent for educational buildings.

POWER SHOW COMPREHENSIVE

Oil-Burning Systems and Pulverized Coal Apparatus Shown—Exhibits Well Attended

A notable feature of the second National Exposition of Power and Mechanical Engineering held at the Grand Central Palace, New York, Dec. 3 to 8, was its comprehensiveness. The exhibits were well attended by engineers, architects and operating officials, and satisfaction with the results was expressed by many of the exhibitors. Approximately 275 manufacturers had booths and the floor space occupied was nearly twice that of last year. Small models of apparatus, full size units, cut-away models showing interior construction, and units in operation were on view. In several cases, moving pictures were used to supplement exhibits.

Five boiler manufacturers had exhibits, and there were three makes of Diesel engines shown. The Climax Engineering Co. had several gasoline power units on view. There were several oil-burning systems shown and makers of pulverized coal apparatus were well represented. A number of companies exhibited hand and mechanically-operated stokers, most of them demonstrating from actual units. Several companies showed special grates and grate bars, and the exhibit of refractory brick, bonding cement and boiler arches was large.

In coal and ash handling machinery models of skip hoists, bucket elevators, ash gates, steam jet and other types of ash conveyors, coal conveyors and other items were shown. Material handling equipment was shown by the Gifford-Wood Co., and an impressive exhibit was that of the Otis Elevator Co., which showed a model of an escalator in operation, an automatic skip hoist controller for blast furnaces, and an automatic slow-down and stopping switch. Fireless steam locomotives were shown by the H. K. Porter Co.

Four makers of surface, jet and barometric condensers had booths, and models of cooling towers were shown. Feed water heaters were exhibited by four companies. The Wheel Condenser & Engineering Co., Carteret, N. J., had its new two-stage hotwell pump with stuffing boxes under pressure, on view. Boiler feed, condensation, vacuum and other types were shown by the Nash Engineering Co. The Bethlehem Shipbuilding Corporation, Ltd., exhibited the Bethlehem-Weir turbo feed pump. Other pump makers included the L. J. Wing Mfg. Co. and the M. T. Davidson Co. Turbine and other types of blowers, for furnaces, oil-burning and pulverized coal were shown.

The exhibits of valves were numerous. In addition to its line of valves the Walworth Mfg. Co. showed flanges, pipe bends, Stillson wrenches and chain tongs. The Crane Co. had a large exhibit of valves and fittings and the Chapman Valve Mfg. Co. showed cast steel gate valves for hand, hydraulic or electric operation. Jenkins Brothers were represented and the Lunkenheimer Co. exhibited a large variety of valves, boiler mountings and lubricators. Pressure-reducing cut-off and blow-off valves were shown by several companies. Hancock valves were shown by Manning, Maxwell & Moore, Inc. The Reading Iron Co. had a booth, and dropped forged fittings were shown by the Henry Vogt Machine Co. and by the Continental Valve & Equipment Co. In addition to Pratt & Cady iron and bronze valves, the Reading Steel Castings Co. exhibited cast steel flanges and fittings.

Steam traps, pump governors, combustion-control apparatus and damper regulators were shown by several companies, and pressure and temperature regulators were exhibited. Among other items were air preheaters, filters, grease extractors, steam separators, air filters for turbo-generator and other cooling systems, water softeners, heat resisting paints, Keystone and Dot lubricators. The Tide Water Oil Sales Corporation exhibited oils and greases. Several makes of tube cleaners and soot blowers were on view.

Condenser tubes were shown by the American Brass Co., Scovill Mfg. Co., Chase Metal Works, and the Bridgeport Brass Co. The International Nickel Co. exhibited monel metal, showing a broad line of products for which the metal is adapted.

Exhibits of testing instruments were numerous and impressive. Several types of CO and CO_2 recorders, indicating and recording thermometers, vacuum gages, water steam and air meters were shown. The Yarnell-Waring Co. showed its V-notch meter in operation and the Bailey Meter Co. demonstrated its boiler meter for recording the steam flow, and air flow and flue gas temperature on one chart. A coal meter was shown by the Bailey company and also a recording tachometer. A number of pressure gages were exhibited. The Dempsey Furnace Co. demonstrated its Constantator, which has 600 positions in which to set stoker speed, fan speed and damper to regulate steam pressures.

Several makers of belting were represented and the Leather Belting Exchange, representing 32 manufacturers, ran tests to show transmission capacity and shippage of various types of belting. A demonstration of how to make belts endless, the different ways of scarfing a joint, was a center of interest. Steel belt was shown by the Sandvik Steel, Inc.

Hanger boxes, ball and roller bearings were shown by several companies. An elaborate exhibit was that of the Boston Gear Works, which had several reduction units in operation, as well as showing several types of gearing and other transmission units. Clutches and pulleys were shown by the A. & F. Brown Co., and among the several exhibits of flexible couplings was that of the Falk Corporation, which demonstrated the new Falk-Bibby coupling. Lubricating oil storage equipment was shown by the Wayne Tank & Pump Co.

Grinding and polishing machines were in operation at the booth of the Production Machine Co., and a line of portable electric drills and floor grinders was shown by the James Clark Jr. Electric Co., Inc. Sawing machines were shown by the Peerless Machine Co. and the Racine Tool & Machine Co.

An educational feature was the exhibit of samples of various types of fuels, including foreign coal. A collection of models of locomotives from the engine which Sir Isaac Newton planned in 1680 down to those of the present was a center of interest. These are the work of Ernest Warther, Dover, Ohio, and are said to have taken more than 10 years to build. Educational motion pictures shown afternoons and evenings throughout the week included the manufacture of alloy steels, the building of locomotives and the story of steel.

Success of Vocational School in Production Gears

Students in the vocational school at Madison, Wis., are engaged in the production of 1000 gears for the Gisholt Machine Co., Madison, under an agreement with Joseph O. Johnson, director of machine shop. The Gisholt company agreed to furnish materials and purchase gears if 75 per cent passed inspection at limits of 0.0002 in. It is found that 90 per cent of the production has met approval, rejections so far being two in 100 gears. The gears are worked on a Gisholt turret lathe of standard shop size, the only machine of its kind installed in a vocational school in the United States. Because of the efficiency reached in the production of gears, the Gisholt company has decided to compensate the school, although the original agreement merely called for the furnishing of materials. The school is installing a Gisholt time recording system to accommodate this and other operations in the machine shop department.

Rockwood Stove Works to Be Enlarged

The Rockwood Stove Works, Rockwood, Tenn., which was organized seven years ago, will be enlarged to make hot-blast heaters and nickel castings. Output and equipment have been increased each year since its organization. Pig iron suited to stove works requirements is readily available from the local furnaces of the Roane Iron Co. A prominent manufacturer of Rockwood stated that stove works would find it highly profitable to locate there, where labor and raw materials are abundant.

TARIFF ON MAGNESITE

Foreign Producers Do Not Appear at Hearing, Which Proceeds Without Them

WASHINGTON, Dec. 11.—The hearing before the Tariff Commission on magnesite on Wednesday of last week took a curious turn when the foreign producers who had applied for a reduction in existing rates failed to make their appearance. Instead they had filed with the commission a petition asking that the hearing be indefinitely postponed, but gave no reason for their request. The commission, however, proceeded with the hearing and it is not known when the applicants for reduced rates will appear or whether they will insist on a hearing at all. The result of their action was that domestic producers and importing interests presented testimony before the commission. The importers, speaking mostly for reduced rates on caustic calcined magnesite, urged reduction in rates.

The principal argument for maintenance of existing tariff rates was made by Nelson Franklin, counsel for the Northwestern Magnesite Co. He challenged claims made in the applications for reduced rates, consisting of groups of Austrian and Czecho-Slovak producers, that the foreign magnesite is superior to the American product. On the contrary, Mr. Franklin said, the American magnesite is the equal in every way of the foreign product, as is shown by the favorable attitude of those iron and steel and other interests which are large users of dead-burned magnesite for refractory purposes. Mr. Franklin also asserted that the claims made in the applications that the present tariff rates had turned the American market over to domestic producers were without foundation. To prove this, he pointed out that the Northwestern Magnesite Co. had been able to sell but 22,000 tons of dead-burned magnesite this year as compared with imports of 45,000 tons. This, he declared, does not present the situation fully because previous to September of this year, 50,000 tons of foreign dead-burned magnesite was put on the American market.

Cost of Austrian Product

Having in mind the fact that investigations of the commission under the flexible provision call for recommendations in changes of rates only upon the basis of the difference in costs in the United States and abroad, Mr. Franklin said that no one in this country knows the cost of producing Austrian magnesite and he expressed the belief that neither the commission itself nor any other source would be able to determine the cost. The heavy importations as compared with sales of domestic magnesite, Mr. Franklin said, actually justified an increase in the tariff duty of 23/40c. per lb., equivalent to $11.50 per net ton, but he said that his company was not seeking an increase. Instead, he said, it is hoping to get into heavier production, thereby reducing overhead costs, and giving the tariff a fair chance. The company was unable to operate in 1921 and 1922, Mr. Franklin said, owing to foreign competition. On Feb. 23 of this year, it put on three out of its five smelters, but since June it has operated only one. The company considers that it has the last word in economical operation, Mr. Franklin said, but despite this has been able to sell but one-third of the domestic requirements.

Chairman Marvin of the commission said that an investigation would require considerable time and it must not be expected that it could be made in a short period.

Results of Investigation

The commission made public the result of its domestic investigation into the magnesite situation at the same time it held the hearing, but did not disclose domestic costs of production because of the absence of foreign costs. It is declared that the cost of magnesite delivered to the consumer is the determining factor in the competitive situation.

The following table gives the estimated cost f.o.b. cars at various consuming centers of dead-burned magnesite from the principal European shipping points for Austrian magnesite. These estimates are based on the average declared value of dead-burned imported to the United States during 12 months ending Sept. 30, 1923, from Trieste and Hamburg. The average declared value at Trieste was $11.48 and at Hamburg was $19.93 per ton, which values probably include a profit:

Point of Delivery	Sources	
	Trieste[1]	Hamburg[1]
Chicago	$37.68	$43.00
Pittsburgh	34.48	39.80
Atlantic ports	30.38	35.70

[1] Does not include foreign port charges or consulation; $0.50 per ton is included for handling at Atlantic ports.

Imports of Magnesite

Imports of dead-burned magnesite for the 12 months ending Sept. 30 of this year are given as 51,889 tons, of which 51,142 came from Austria, the value per ton for the total being $13.22. The average production since 1912 has been between 450,000 and 500,000 tons yearly and covers all kinds of magnesite. The dead-burned, however, constitutes the great bulk.

For each man-shift at the mines, an average of 1.8 tons of crude magnesite is produced, the report says, in dealing with labor costs in this country. The average wage rates in the California industry are from $4.25 to $5 per day, and in Washington from $4.50 to $5.50 per day of eight hours. The yearly average prices of magnesite per ton f.o.b. for 1923 are given as $13.70 for California crude, and $33 for Washington, $41 for Chester, Pa., or Baltimore for dead-burned and $66 for magnesite brick at works. Distribution of domestic consumption for the first nine months of 1923 is estimated at 7⅛ per cent for dead-burned; 27.7 per cent for caustic and 0.5 per cent for crude. Washington is said to have crude ore reserves of 22,900,000 net tons as against 1,422,000 net tons for California. At the average consumption for the last 12 years, 287,000 tons per year, these reserves would last for 85 years without imports. At the maximum consumption of 367,000 tons in 1920, these reserves would last 66 years. It is declared that domestic production before the war was insignificant. From 1916 to 1920, inclusive, domestic production was 85 per cent of consumption. In 1921 and 1922, most of the domestic plants, it is stated, were shut down and domestic production was 28 per cent of consumption. Since the present tariff act became effective, there has been some revival, it is pointed out, but production is still less than 50 per cent of present capacity.

"The entire domestic production is along the Pacific Coast," says the report. "The center of consumption for caustic is presumably near the center of population in Indiana; while the center of consumption for dead-burned is undoubtedly close to Pittsburgh on account of its use for lining steel furnaces.

"For the making of refractory brick no suitable substitute for dead-burned magnesite has been found, but for furnace bottoms and for minor repairs dolomite may be used. The presence of a certain amount of iron in dead-burned magnesite seems necessary; in the Austrian magnesite this occurs in the crude ore as mined, while in Washington iron is added, making a synthetic product of uniform quality claimed to be equal in every way to the imported product. In view of actual acceptance of large quantities of domestic dead-burned, the question of preference for foreign dead-burned probably can be eliminated."

The National Malleable Castings Co., Cleveland, has changed its name to the National Malleable & Steel Castings Co. in order to more clearly indicate the scope of the company's business, which includes steel castings as well as malleable iron castings. The company has plants in Cleveland, Indianapolis, Ind., Sharon, Pa., Toledo, Ohio, and Chicago.

The Alliance Machine Co., Alliance, Ohio, shipped to Spain recently a soaking pit charging crane and a stripper crane to be installed at the iron and steel works being built by the Compania Siderurgica del Mediterraneo at Sagunto. Frank C. Roberts & Co., Philadelphia, are engineers for the plant.

Japan's Iron and Steel Industry—II*

Slow Development of Steel Making Until the World War Stimulated Operations—Labor Problems in Their Infancy

BY DR. ING. E. KOTHNY

UP to the time Japan began to expand, and even a few years after that time, it met its small demand for pig iron and steel by home production in the ancient works, the main seat of which was in the southwestern part of the main island, today's government district Chugoku. The iron works made iron from magnetite sand on charcoal hearths by the Frishen process. In addition there were smaller iron works, some with charcoal blast furnaces, in the Provinces of Ou and Iwate. With the progress in the development of the industry the demand for pig iron and steel increased to such an extent that it could not be met by the old plants. Furthermore, these plants could not compete with foreign products and consequently went under, or at the best made a bare living. They were of local importance only.

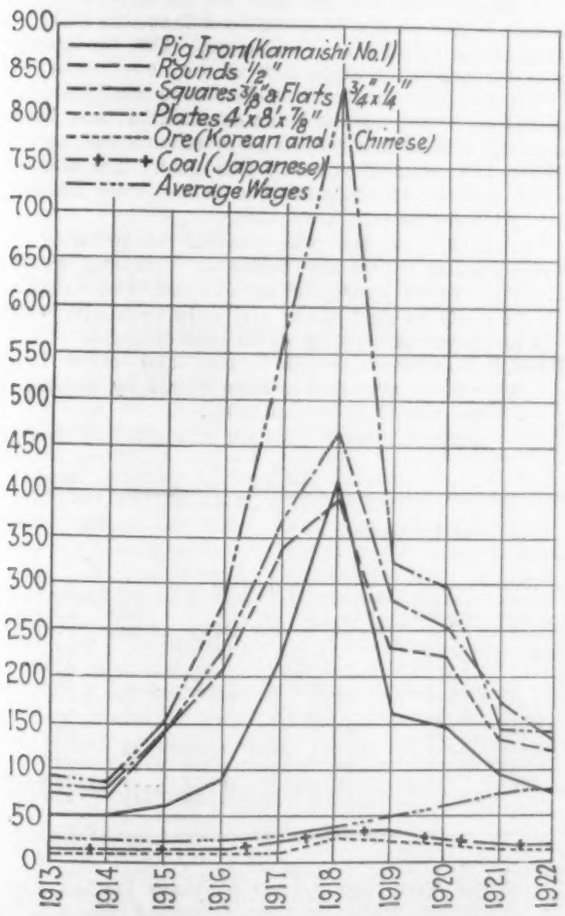


Fig. 3—Development of Prices of Pig Iron and Finished Steel, Ore and Coal Prices and Wage Rates, From 1913 to 1922 Inclusive. Prices are in yen (1 yen is about 50c.). Wages alone show a steady advance

First Modern Japanese Plants

Until the end of the nineties of the last century almost the entire steel consumption was covered by importation. Until that time no modern steel works had been started. Among the old plants the most important was the Kamaishi steelworks. The Japanese Government, however, soon recognized the advantage to the country of having its own steel industry. It, therefore, took the first steps for the development of this industry by building a modern blast furnace and steel plant and started toward the end of the nineties the Government steelworks Wakamatsu, also called Yawata† or steel plant Etsu, which in the course of the following year was extended and is today the largest and most modern steel plant of Japan. It was equipped for the production of shapes and merchant bars, ship plates, rails, wire and war material.

This attempt of the Government, however, found no response from Japanese business men. The returns of the Government steel plant were not sufficient proof to them that making iron and steel in Japan could be profitable. The steelworks had not shown a profit up to the first years of the war; on the contrary, repeated allowances had to be made by the Government to cover its deficit. The number of iron and steelworks founded in Japan up to the time of the World War was consequently very small. Only a few steel plants came into being, and these owed their existence to Government contracts for the army, the navy and the railroads.

In 1903 the Kobe steelworks, and in 1906 the Japan steelworks in Muroran (Hokkaido) were organized. Both plants built Siemens-Martin (open-hearth) steelworks, which were equipped for the manufacture of steel castings and steel forgings for the navy, the merchant marine, shipyards and the railroads. In 1906 the largest Japanese shipbuilder, the Kawasaki Dockyard Co., built its own steel plant, to cover its requirements of steel castings and forgings.

In 1912 the Japan Steel Tube Co. (Nippon Kokwan K.K.) began the construction of its works in Kawasaki, province Tokio, to make Japan independent of foreign countries in regard to the supply of rolled steel pipe. Besides this they built rolling mills for merchant bars and shapes, as well as boiler and ship plates. The steel plant Kamaishi, too, showed in the meantime further developments. Especially Japan's wars before the World War greatly influenced the steady development of this plant.

Profits Not Obtainable

To sum up, until shortly before the war only such plants had originated, besides the Government steel plant, as had profitable operations guaranteed or at least anticipated, either by assistance in the form of Government orders, or by supplying the home market or specializing in a particular line. Two reasons for the inability of the Government plant and other plants to operate at a profit, in competition with foreign products, are as follows:

1. The higher price of Japan's coke and ore resulted in higher cost of these materials per ton of pig iron than in other countries. Table IX gives a comparison of material costs in Germany, America and Japan, according to 1912 prices. In this tabulation the Japanese and German prices are converted into dollars at normal prewar rates.

2. In Japan, due to the insufficient education of the working men for their calling, the efficiency of a plant was lower than that of a plant of equal size

*Translated from *Stahl und Eisen* of June 14 and 21, 1923, by Paul Cebrat, Perin & Marshall, New York. The first section, dealing with pig iron and its raw materials and with imports, appeared at page 1317 of our Nov. 15 issue.

†On page 463 of THE IRON AGE, Aug. 23, this plant will be found near the southwest end of Japan, on the map showing the locations of the seven blast furnace plants of China.

Table IX.—Average 1912 Prices (a)

Subject	Japan Price per Ton	Japan Cost per Ton of Pig Iron	Germany Price per Ton	Germany Cost per Ton of Pig Iron	United States* Price per Ton	United States* Cost per Ton of Pig Iron
Coke	$7.20	$7.20	$3.72	$3.72	$3.00e	$3.00
Ore	2.85b	5.70	1.20c	3.60	3.00d	6.00
Total		12.90		7.32		9.00
Price of pig iron		$22.57		$14.76		$14.00

Notes: (a) Based on normal exchange rate: 1 mark = 24c. and 1 yen = 50c.
(b) Chinese Haematite with 55 per cent Fe.
(c) Minette with 35 per cent Fe.
(d) Lake Superior non-Bessemer with 51.5 per cent Fe.
(e) Connellsville.
*Figures for the United States, not in the original article, have been added for comparison.

in Europe or America. Production cost was therefore higher than in other countries, in spite of lower wages. In many new installations many labor saving devices were omitted on account of the low wages, which had an unfavorable influence on production cost, in spite of the low wages.

In pig iron and ordinary merchant iron, therefore, Japan could not compete with the tonnage production of other countries. The cost of shipping and the import duty did not give the Japanese industry sufficient advantage for a healthy growth on a solid foundation. Before the war a steel industry capable of supplying the home demand could have developed only if foreign competition had been excluded, or at least made more difficult by a sufficiently high import duty. At that time the duty on pig iron was very low, only 1.67 yen (83c.) per ton. For merchant bars the duty was considerably higher, being 10 yen, ($4.98) per ton, equalling about 12 per cent of the value.

Table X.—Merchant Ship Building

Year	Registered Tons	Year	Registered Tons
1913	64,664	1918	489,924
1914	85,861	1919	611,833
1915	49,408	1920	456,642
1916	145,624	1921	227,425
1917	350,141	1922	83,419

Effect of the World War

An inducement to develop the steel industry did not exist before the war, which, with its effects and its lessons, was of great influence in the development of the Japanese steel industry. The elimination of imports from Germany which, according to Table VII (page 1319, Nov. 15) had amounted to almost one-third of Japan's imports of merchant iron, and the great difficulties of importing from America and England, resulted in the demand for pig iron and steel being satisfied only with the greatest difficulties. Japan soon perceived the splendid opportunity offered it by the war to improve considerably its merchant marine and to develop its industries, since the war opened large territories of the world for exportation.

Demand for pig iron and steel grew rapidly soon after the beginning of the war. Caused by the great difference between supply and demand, prices of pig iron and steel increased from day to day. Fig. 3 gives a picture of the development of pig iron and steel prices before, during and after the war. It shows that in the beginning, with nearly constant wages, coal and ore costs, the prices for pig iron and steel rose rapidly.

Production of pig iron and steel became extremely profitable. Plants already in operation were able to pay dividends of 100 per cent on the capital investment. It can readily be understood that this attracted Japanese merchants and financiers. The Government also recognized the advantage to the country, in case of war, to have its own well-developed steel industry, capable of supplying the home demand. It was therefore the aim of financiers and merchants, as well as of the Government, to reach this goal. The Government assisted in organizing a home steel industry by two measures:

1. In 1917 a law was enacted to promote the steel industry, with the following principal points:

A.—The law of expropriation of land was extended to apply to steel works and refining plants which had a yearly capacity of 35 tons or more.

B.—All Government-owned forests and other lands were made available to steel works by leasing or selling, except in special cases.

C.—All persons employed in the construction of steel plants were exempt from all taxes for ten years, beginning with the year following the starting of construction of the plant.

Table XI.—Production and Imports of Ferroalloys
(Quantities in Metric Tons)

Year	Spiegel Prod.	Spiegel Imports	Ferromanganese Prod.	Ferromanganese Imports	Ferrosilicon Prod.	Ferrosilicon Imports	Production Fe, Mn, Si	Production Fe-Wo	Production Fe-Cr	Production Other Alloys	Fe-Cr and Other Alloys Imports
1912	....	804	1,413	1,107	....	865	....	....	....	....	690
1913	....	1,814	2,313	4,047	....	1,706	....	....	....	....	673
1914	63	655	1,442	1,084	....	1,097	....	....	....	....	207
1915	....	579	2,879	2,654	....	1,530	....	....	....	....	1,071
1916	....	940	3,201	2,351	....	1,971	....	....	....	....	345
1917	1,707	1,227	7,339	603	2,431	465	....	....	....	....	535
1918	2,174	9	11,647	764	6,994	376	306	153	214	....	72
1919	2,067	....	10,831	2,519	2,948	295	1,246	213	1,376	38	339
1920	1,084	....	4,203	510	930	447	150	103	920	72	118
1921	453	....	4,515	707	904	....	34	66	1,522	....	270
							....	25	1,536	141	

Table XII.—Changes in Cost of Living and Wages
Per Cent Increase or Decrease Based on 1912 = 100

Subject	1912	1914	1917	1919	1920 First Half	1920 Second Half
Necessities of life—						
Cereals—Rice	100	76	95	225	247	183
Cereals—Average	100	36	108	211	247	168
Other food	100	101	116	190	237	229
Clothing	100	92	156	272	382	333
Other articles	100	99	151	262	318	257
Total average	100	96	145	238	292	245
Wages—						
Agricultural	100	104	117	236	236	281
Clothing trade	100	102	123	232	232	306
Food industry	100	103	126	233	233	272
Building trade	100	99	113	210	210	287
Carpenters	100	101	120	227	227	294
Other labor	100	100	121	226	226	301
Average	100	102	119	226	226	291

D.—Ore imported for such plants was admitted duty free.
E.—All materials used in the construction of such plants were allowed to enter free of duty.
F.—The product of iron ore mines organized in Korea was exempt from import duty in Japan.

2.—The Chino-Japanese mining agreement assured the ore and coal supply for a home steel industry.

Many New Plants Built

Stimulated by the large profits and the assistance given the steel industry by the Government, a great number of new enterprises was brought into existence during the war, existing plants were enlarged, and old plants that for a long time had ceased to operate, on account of their inability to compete, were brought into life again and modernized. Shipbuilders endeavored to produce their own steel; their consumption was large, since shipbuilding developed vigorously. Table X shows the extent of Japanese shipbuilding from 1913 to 1922.

The Kawasaki Dockyard Co., Kobe, which in 1906 had already started operations in its own steel plant, enlarged this by the addition of a rolling mill for merchant bars and shapes, and later built a second steel plant with a plate mill to fill the requirements for ship plates. The second great shipbuilding concern, the Mitsubishi Dockyard Co., made itself independent, regarding the supply of pig iron and steel, by constructing a blast furnace and steel plant in Kenjiho, Korea, which was equipped for the production of merchant bars and shapes as well as ship plates. To the shipyard in Nagasaki was added a steel foundry to supply the various yards of this concern with steel castings. The newly organized Asano Shipbuilding Co. built at the same time its own steel plant.

For the Imperial steelworks a large extension program was planned by which its capacity was to be increased to 750,000 tons of pig iron and steel annually. The old blast furnace and steel plant Kamaishi was further enlarged. New blast furnace plants, as the Hokkaido Seitetsu K.K. (Hokkaido or Wanishi Steel Co.), the Toyo Seitetsu K. K. (Orient Steel Co.), the Honkeiko Iron Works and the An-Shan blast furnace and steel plant were built. It is said that the latter exceeds in capacity the Imperial steelworks. It was planned to enlarge the An-Shan works to produce up to 1,000,000 tons of pig iron and rolled steel annually. The Kobe steelworks plant was enlarged by the construction of a new steel plant. The big Japanese concern Sumitomo, which is interested in nearly all branches of industry, also entered the field of producing steel. It constructed a steel plant, which was equipped for the production of steel castings and heavy forgings for merchant and warship builders, railroads and machinery builders.

Special Products

Some concerns also took up the manufacture of special steels. In some of the old plants, using the Frishen process on charcoal hearths, electric furnaces were installed, and new electric steel works were built which turned toward this new field. In spite of all these installations, today by far the largest part of special steel has yet to be imported. Exact data regarding the consumption and the importation of this material are not available, since the import of special steels is not listed separately in the statistics issued by the customs offices. Imports were made from England, Germany, Austria and Sweden.

Production of gray iron foundries also increased considerably during the war, though no statistics are available. From the total pig iron consumption and that used for conversion into steel it can be estimated that, in Japan's iron foundries, up to 400,000 tons of pig iron were made into iron castings. The larger foundries are usually connected with machine works or shipyards. Many of the plants constructed during war times are now lying idle or have been converted to other uses.

The production of ferroalloys increased in a similar manner. Table XI shows Japan's production and imports of ferroalloys from 1912 to 1921.

Prices, Profits and Expansion

With pig iron and steel prices during war times constantly rising, and the consequent large profits of the steel industry, the desire to organize new steel companies grew more and more. New steel companies grew like mushrooms after a rain. The end of the war, however, interrupted this feverish development. From Fig. 3 it can be seen that the end of the war was followed by a rapid decline of pig iron and steel prices.

This decrease, however, was not accompanied by a decline in coal and ore prices or wages. In spite of the war being ended, prices of food and other necessities of life increased, and instead of wages being reduced, they had to be raised again and again. Table XII illustrates the fluctuations in the cost of living and the different wages between 1912 to 1920, since when prices have not materially changed. Table XII indicates that, in a general way, the increase in wages corresponds with the increase in the cost of living. No improvement in living conditions was obtained by the Japanese workman with the higher wages.

In the construction of their works quite a number of newly organized plants had, as the main object in view, production as quickly as possible, so as to participate in the high prices in the shortest time. In consequence, construction procedure was not always systematic. Nor in all cases was the necessary attention paid to the mechanical equipment. In some instances old plants, which had been discarded in America, were purchased. Auxiliary departments, especially, were in many cases not equipped with the necessary mechanical devices, necessitating much manual labor.

When the Slump Came

Declining prices and continuously rising wages soon resulted in heavily curtailed or entirely disappearing profits. Most of the plants created only at the end of war times abandoned, therefore, the construction of proposed plants or stopped further building. Contemplated extensions of existing plants were postponed, and it is questionable whether they will ever be completed. Among those who were compelled to postpone their ambitious plans should be mentioned particularly the An-Shan iron and steel works of the South-Manchurian Railroad. The postponement of the completion of this plant has also another cause: up to the present no economic method has been worked out to treat the ores, which are the foundation of this project. As long as this question cannot be solved satisfactorily, the future of this enterprise is entirely problematical.

(To be concluded)

Locomotive Output More Than Double Same Period in 1922

The Department of Commerce, Washington, announces that total shipments of new locomotives from manufacturing plants in the United States during the 11 months of 1923 ended Nov. 30 were 2860, of which 2680 were for American railroads and 180 for foreign roads. This is more than double the number turned out in the same 11 months of 1922, when 862 domestic locomotives and 202 for foreign use were built and shipped by American locomotive shops.

Unfilled orders on Nov. 30 showed a reduction from those of Oct. 31. At the end of November, there were unfilled orders for 656 domestic locomotives and 35 for foreign use, a total of 691, while at the end of the preceding month the total of unfilled orders was 977. At the end of November, 1922, the locomotive shops had unfilled orders for 1619 locomotives, the last quarter of 1922 having been marked by more active buying than the last quarter of 1923.

Conveyor System in Continuous Motion

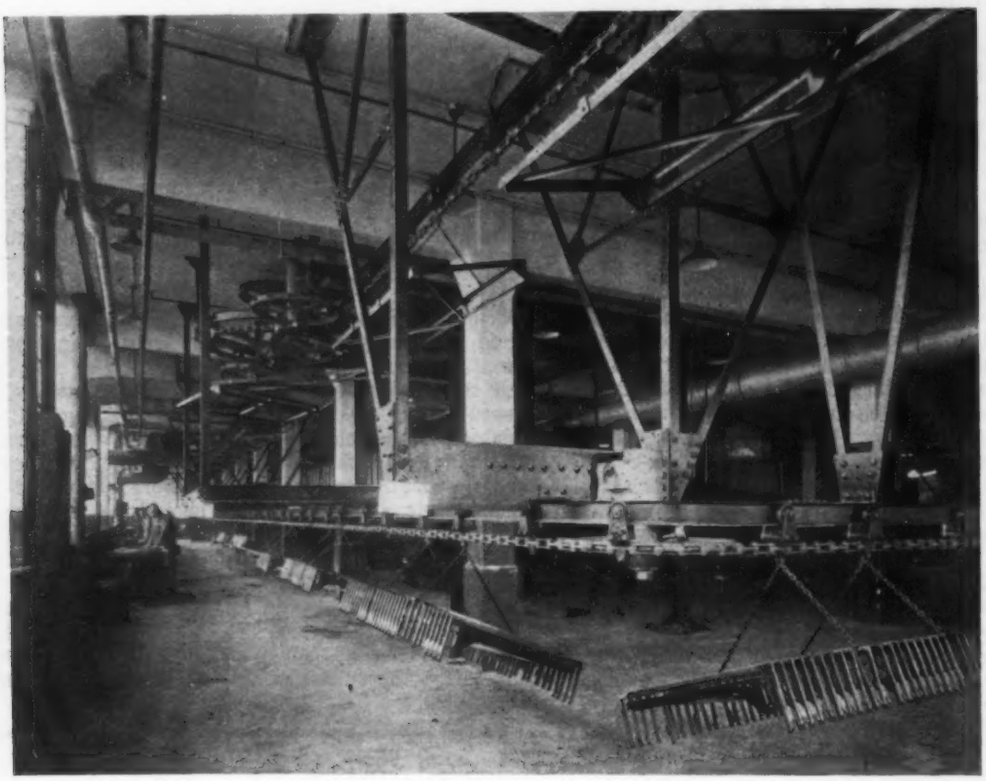
Handles Windshield Frames Into Tanks and Through Ovens Without Pause—Capacity 3000 Pieces in 9 Hr.

MARKED saving in labor, increase in production and improvement in the product has been effected at the plant of the Ternstedt Mfg. Co., Detroit, by the installation of a chain conveyor system for handling frames of automobile windshields during the enameling, baking and other operations. Features of this conveyor are its length, which is 1300 ft., and the numerous turns it makes in its winding course through the enameling department.

The conveyor consists of an I-beam runway on which run trolleys having roller bearings and placed on 4-ft. centers. Permanently attached to the trolleys and suspended by two chains are racks 7 ft. long and 4½ ft. wide, on which the work is placed. The conveyor makes 16 right-angle turns in its complete circuit through the enameling department, the chain passing around large sprocket wheels in making these turns. In addition it makes several upward and downward turns, at some points being near the floor and at others close to the ceiling, leaving a clear floor space below.

On reaching the enameling department, the frames are cleaned in a series of tanks located along one side of the room. After being washed and wiped they are placed on the racks, 30 pieces on each rack, the loading section of the conveyor being directly back of the cleaning tanks. The conveyor is in continuous operation, moving at a speed of approximately 18 in. per minute, and such hand operations as are required in the process, as going over the pieces with wire brushes after the first baking, are performed by one or more operators as the work passes their stations. The conveyor and enameling equipment have a capacity of approximately 3000 pieces in a 9-hr. day.

The conveyor first passes over a dip tank, in which the parts are submerged and given a lacquer coat, and then over a 70-ft. drain section. Then it enters the first oven, in which the lacquer coat is baked. After this operation the pieces are given a spray coat of enamel, the work being lifted from the rack for spraying. Then the pieces go to another oven for a second baking, which is followed by a second spray coating of enamel and the third or final baking. Then the frames pass to the inspection department, after which they are loaded for shipment. The emptied racks move around to the loading platform for reloading.

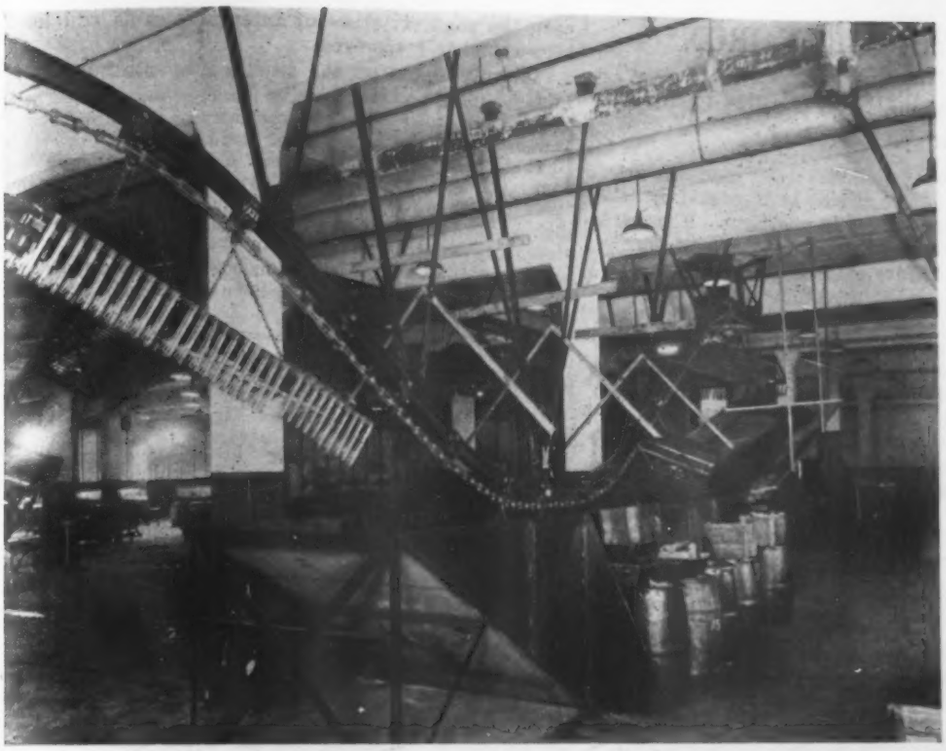


Taken Near the Loading Station, This View Shows the Design of the Conveyor and the Method of Handling the Windshield Frames. Near the ceiling appears a section of the conveyor with the racks empty. Note the prongs on the racks, to separate the pieces being carried

Baking is done in Maehler automatic gas-fired ovens, each of the three ovens being 90 ft. in length. The oven temperature is automatically controlled, being 250 deg. Fahr. at the oven entrance and 350 deg. at the outgoing end. At the conveyor speed used it takes 1 hr. for the work to pass through the oven. The conveyor is driven by a 20-hp. motor through a 400 to 1 reduction gear. An automatic takeup eliminates slack in the chain. The conveyor system was installed by the James F. Miller & Hurst Corporation, Detroit.

The company has found that with the use of the conveyor system it has secured a uniform coating of enamel as well as a uniform baking and color of the enameled parts, due to the even temperature of the oven and the method of handling the material on racks. The improvement in the finished product as compared with that made by the former method is estimated at 50 per cent.

Artificial ventilation is provided to assure clean atmosphere in the enameling department. A ventilating system supplies some 50,000 cu. ft. of air per minute.



Here the Frames Enter a Dipping Tank for the First or Lacquer Coat and Then Pass Over a 70-Ft. Draining Board on Their Way to the First Baking Oven

The 1300-Ft. Conveyor Is Driven by a 20-Hp. Motor Which, With Its Reduction Gear, Is Shown in the Foreground. Here the frames, after spraying, are entering one of the baking ovens

This Shows a Loop in the Conveyor and the Method of Making a Right Angle Turn by Means of Large Sprocket Wheels

QUALITY OF GRAY IRON*

Recent Progress Made—High Tensile Castings—Pearlitic Cast Iron

As to the progress which has been made in gray iron quality, this perhaps can best be discussed by asking and making answer to certain questions. Has there been any real improvement in the product itself during the past 30 years? Are we at a standstill in this particular and, if not, in what direction can we look for betterment? Have improvements been made in uniformity of product? Have we kept pace with the demands of the engineer designer, forced upon him through the many special requirements for increased ultimate strength and decreased brittleness, such as those occasioned by the intricacies of the machines he is at times called upon to build, parts of which must be such as to stand up in service against high pressure and temperature without alteration in dimensions or contour, with freedom from leakage and a machineability such as to permit maximum production, or such as those involved in the making of castings for surface plates or straight edges that will remain perfectly true after they have been machined to dimensions, etc?

We perhaps can answer these questions and analyze the situation to better advantage if we take into account the mechanical properties by which the quality of a metal is usually measured, and the effect of heat treatment on these properties, through which procedure we can see more clearly where we stand. These mechanical properties ordinarily comprise tensile strength, elastic limit, reduction of area and elongation. Inasmuch as ordinarily the gray iron casting as cast possesses trivial, if any, ductility at all we are forced to ignore the last two items, for in the absence of ductility there can be no reduction of area or elongation. Also in the absence of ductility the elastic limit will practically coincide with the ultimate strength, so that in referring to the latter we are including the former. We find that the introduction of steel in the mixture has resulted in the production of a stronger casting, the average ultimate strength of which may be placed at about 33,000 lb.

High Tensile Cast Iron

A special gray iron product that will average around 50,000 lb. ultimate, possessing a measurable ductility, machineable at practical speed, and for which there is considerable demand is now being produced at a foundry in the South. In the case of 10 tensile test bars of this product tested by the Bureau of Standards, the lowest ultimate strength was 45,300 and the highest 56,500 lb.; the elongation in the case of four of the bars was one per cent, while the average Brinell was 290—results which are quite remarkable as compared with semi-steel.

That any specified gray iron product now can be made with a very fair degree of uniformity by even those not equipped with a chemical laboratory must be acknowledged, as dependable blast furnace analyses accompany each car of pig iron shipped. Actually, what we are safe in stating is that uniformity of product can be assured; that great progress has been made in ultimate strength in the case of such castings as are not required to be machined; that this would not obtain in the case of castings which have to be machined to accommodate present-day mass production; that through the use of ferroalloys or the straight additions of certain metals the possibility of making a product of high ultimate strength that will be easy to machine is remote; that, in the absence of heat treatment, no one has been able to impart to the slightest degree any ductility to gray iron, except to the trivial extent found in the very strong castings previously referred to. When heat treatment is applied today it is for the purpose of increasing the machineability of small castings; for the development of torsional or transverse ductility, and for the quick ageing of castings, to the end that even the slightest trace of internal strains will have been completely removed.

We might sum up the situation by stating:

That little if any improvement has been made in mechanical properties in the case of those castings that are required to be machined at a high rate of speed.

That considerable improvement in ultimate strength has been made when machineability is not a major requirement.

That no improvement has been made in ductility except slightly as indicated in the high tensile strength gray iron product previously referred to.

That, at the expense of ultimate strength, castings can be heat treated in order to make them more easily machined, and finally

That they can be heat treated in such a manner that the ultimate strength may be very slightly increased and some torsional ductility established in the case of thin sections.

Pearlitic Cast Iron

Before concluding my talk on gray iron I would call your attention to a character of product now being marketed in Germany under the name of "pearlitic cast iron" concerning which the speaker cannot talk authoritatively regarding commercial possibilities or mechanical properties. It is a comparatively new step and, in the thought that some of you may have heard of these castings and do not quite understand why the product has been given this name, a few words of explanation follow.

It is possible to have a casting in which all of the carbon is present as graphite; or, one in which all of the carbon is combined; or, the usual case where a comparatively small percentage of the total carbon is in the combined form and the balance in the form of graphite. When combined carbon is present, it is because during the solidification of the iron all of the carbon fails to separate out as graphite, with the result that the amount that does not separate unites chemically with a definite amount of iron to form a hard alloy, which in turn immediately mixes mechanically with more iron to form a tough and strong aggregate called pearlite.

To be somewhat more explicit, let us consider an iron that contains 0.25 per cent of combined carbon; which represents the amount of carbon that refused to separate out as graphite. Now, while this amount of carbon is in itself trivial, it happens that it will unite with 15 times its own weight of iron to form a very hard carbide of iron which, as soon as formed, will mix spontaneously with eight times its weight of iron to produce the aggregate referred to. In short, from this minute quantity of combined carbon there will be formed 30 per cent of the strong and tough mechanical mixture called pearlite. As about 0.85 per cent of combined carbon will yield 100 per cent of pearlite, the structural composition of a cast iron with this percentage of combined carbon will consist wholly of a ground mass of pearlite, throughout which will be distributed the balance of the carbon in flakes.

Pearlitic cast iron therefore is an iron in which the ground mass consists essentially of pearlite. The procedure used in the making of this product is to pour in a highly heated sand mold molten iron low in phosphorus, fairly low in carbon and in which the silicon content has been so adjusted that the fracture of the casting would be white if the molten metal had been poured in an ordinary green sand mold. When poured in a highly heated sand mold, however, the cooling of the iron is so retarded that time is available for considerable of the carbon to precipitate as graphite, with the result that instead of a white fracture being produced the fracture will be gray. Structurally, the ground mass will be wholly or almost wholly pearlitic; the particles of graphitic carbon will be rather small and of a nodular rather than a flaky form; the casting will be free from internal strains; while the metal will be tough and strong and accompanied with some slight ductility.

Concerning the actual mechanical properties I have been unable to secure reliable information. It is apparent that the method of manufacture would be costly in the absence of some continuous method whereby permanent sand lined molds are used or some scheme employed of which the speaker is in ignorance.

*From an address by Enrique Touceda, consulting metallurgist American Malleable Castings Association, Albany, N. Y., delivered before the National Founders' Association in New York, Nov. 21.

Germany Under Currency Stabilization

Unemployment Estimated at 2,500,000—Ruhr Agreements with French Onerous—Hugo Stinnes Reaches for Control in Czecho-Slovakia and Poland

BERLIN, GERMANY, Nov. 24.—The fall of the Stresemann coalition cabinet has coincided with agreements between the Ruhr industrials and the French occupying authorities, permitting the resumption of work. The "rentenmark," a supposedly stable currency of one gold mark value, which first appeared Nov. 15, is Stresemann's most notable achievement. The retenmark is convertible into mortgage bonds, which are in turn secured on land and industrial property. It is doubtful whether the new currency will be really stable. As a result of the enormous recent rise in gold prices, which is a result of the Government's policy of artificially keeping down the dollar exchange, the rentenmark, being in law a goldmark, has in the home market only a fraction of the purchasing power of a pre-war gold mark; and has, therefore, already depreciated. The Stresemann anti-Cartels law has come into force and has resulted in the moderation of selling conditions by some of the large steel companies. Against others the authorities have instituted proceedings before the new Cartels Court. Official salaries and a part of wages are now largely paid in rentenmarks. The eight hour labor law no longer exists. This measure was enforced by a decree dating from the period of demobilization, which was last renewed up to Nov. 17, but has now lapsed. The Socialist party is pressing for its revival. Representatives of the iron and steel traders have resigned from the Steel Syndicate as a protest against the conditions imposed by the Syndicate's price commission.

The Ruhr industrials were compelled to come to terms with General Degoutte as a result of the Federal Government's inability to grant further subsidies for paying of wages and for unemployment pay. These payments ruined finances and would have killed the new rentenmark currency, the survival of which depends upon balancing the budget. Since the French occupation the Republic has advanced for pay and unemployment support 140,000,000,000,000,000,000 paper marks, at present exchange 140,000,000 gold marks; of which 90,000,000 were advanced through the Steel Financing Co., and 40,000,000 through the Coal Financing Co. Most of this money was advanced on "valorisation" (wertbestaendig) lines, which means that the debtors undertook to pay back in paper marks a sum equal in gold value to the gold value of the original paper mark loans. The industrials' debt is equal to nearly three-quarters of the whole present Federal debt of 191 quintillion paper marks. The Cabinet borrowed 100,000,000 rentenmarks from the new Rentenbank in order to prolong unemployment pay on the Ruhr; but the Rentenbank asserts that it will advance no more money for that purpose.

The agreement with Degoutte is very onerous for the industrials. The agreement was accepted by them in order to avert a hunger catastrophe, but it is doubtful whether it will succeed. The coal mining companies undertake to pay to France $15,000,000 for coal tax not paid up to Nov. 1, and to pay in future a coal tax of 10 fr. per ton, although the coal tax has been abolished elsewhere in Germany. The owners must deliver 18 per cent of their future net coal production to the Allies.

The stocks lying on the Ruhr Oct. 1 become the property of the Allies. The frontier between occupied and unoccupied Germany remains and French export licenses are required. This agreement was signed by or for the Stinnes Deutsch-Luxemburg company and the Gutehoffnung, Dortmund-Union and Harpener corporations; and binds, according to a French estimate, 80 per cent of the mines, factories and mills of the Ruhr. The chief difficulty in executing the agreement is that while the French agree that the deliveries shall be booked to reparations account, Berlin adheres to its resolution not to compensate the industrials. Berlin has also stopped compensating exporters to England for the 26 per cent of sale price which England compels native buyers from Germany to deduct under the Reparations Recovery Act. This will probably stop all export of German metal goods and machines to England, as the 26 per cent burden cannot be put on the British consumers' shoulders in shape of higher German export prices.

The continuing rise in German gold prices, which now far exceed prices in the world markets, make this transfer of the burden impossible. The higher German gold prices are, of course, not a reality. They result from the fact that while the Berlin Government keeps the official Bourse quotations for foreign exchanges far below the real value, German domestic prices conform not to the official exchange rates, but to the mark quotation abroad. This seriously damages export, as the exporter is obliged by law to sell 30 per cent of his foreign currency receipts to the Reichsbank at the low official exchange. Owing to its policy of depressing the exchanges, the Reichsbank now receives hardly any foreign currency and has of late been obliged to ration applicants for exchange to 1 and even ½ of 1 per cent of the amount demanded.

The condition in the steel and iron industry has grown steadily worse, but temporary improvement may result from the new Ruhr agreement. On Oct. 31, the last date for which precise data are available, 18.9 per cent of the steel workers were unemployed, and 51.39 per cent were working from 1 to 25 hours per week less than schedule. The number of unemployed in all Germany is probably close to 2,500,000. Because of this stagnation, November has witnessed a sharp decline in coal imports, but pending negotiations for British coal credits may lead to a slight recovery. Ore imports in September, the last month for which figures have appeared, recovered to 267,227 metric tons against 120,241 tons in August, but remain far behind the 917,811 tons, the monthly average in 1922. Iron and steel companies in unoccupied territory report operation on old orders, but great reserve is shown in placing new orders. Buyers fear that the Ruhr settlement may release large quantities of steel, with a resultant price decline. The gold-mark and shilling prices of the Steel and Pig-Iron Syndicates have not been changed.

South German firms report that a great many orders have been cancelled. At the artificial official mark exchange, foreign metals are cheaper than domestic products. The Essen *Bergwerks Zeitung* reports that at a time when British bars were delivered f.o.b. British port at £8 10s. German bars cost £11 8s. Many German firms prefer to give orders to the Saar, Lorraine, Luxemburg and Belgium. German Upper Silesia also reports a decline in orders for some materials, but pig iron demand continues. Inability to obtain foreign exchange threatens the supply of ore. Reports of the Hagen, Velbert, Solingen and Schmalkalden small iron-goods and high grade steel districts are all unfavorable. Practically no foreign orders are being received. Here too, the artificially low dollar exchange held by the government has caused havoc.

The Elberfeld Eisen und Stahlwaren Industriebund, representing manufacturing, has petitioned the government demanding measures of relief. The ironware and steelware industry, says the petition, is essentially an export branch, 70 to 80 per cent of the output going to foreign markets. At present, export is threatened not only by French measures but by excessive production costs. The government is asked to bring down

rates for coal, iron and transport to peace schedules. Export control and the attendant fees, says the petition, must cease. In order to ensure a plentiful supply of raw materials, import duties should be abandoned. Finally credit for industry must be better organized and burdensome taxes, including the Industrial Tax, should be abandoned.

There is an abundance of scrap-iron as a result of the decline in melting, and agitation is strongly in favor of free export. The French authorities confiscated, without removing, large stores of scrap in the Ruhr, as retaliation for the non-payment of the coal-tax.

The General Electricity Co. (A. E. G.), in collaboration with its Austrian company, the A. E. G. Union, is founding an A. E. G. company in Czecho-Slovakia. The Enzinger Co. of Worms and the Union Maschinen A. G. of Mannheim have come to an agreement for cooperation through exchange of shares. Hugo Stinnes is reported to have acquired control of the Becker coke companies, which are near the Stinnes-controlled Bochum Cast Steel Co. Polish measures to prevent control of native works by Stinnes are under way under leadership of M. Korfanty, working with French financiers and with several Vienna banks.

BELGIAN MARKET STRONGER

No Change in Prices, but Exchange Reduces Cost in Dollars—Coke Receipts Still Limited

ANTWERP, BELGIUM, Nov. 24.—With present demand fair and a good backlog of orders, makers are no longer disposed to offer concessions to attract business. Increases of prices are considered practicable as the rate of exchange is higher than at the beginning of the month and prices offered from abroad result much better for Belgian exporters and makers. Furthermore, the political situation in Germany seems to be growing worse and fear of an early resumption of German iron and steel competition on a large scale has subsided. Greater confidence in prices has resulted and it is now generally expected that buyers will begin to place orders in hand and an increase in prices may occur at any time. It seems evident that the Belgian market, although not entirely guided by the rate of exchange, is largely affected by exchange fluctuations.

Activity in semi-finished products is satisfactory, although British demand is not so great as it has been in the past. However, no large quantities are available. Works are well booked on rolled material and are rolling all their production of ingots. The few producers with small lots available foresee a higher market than prevails at present and in consequence abstain from quoting. Production in Belgium, as well as in Luxemburg, is controlled by the coke receipts and production which is still limited. Increases of prices early this week have thus far been small, but the situation is such that the upward tendency may be greatly accentuated. Billets are no longer obtainable at less than 625 fr., or $29.10, while a fortnight ago the price was 580 fr. or, with the rate of exchange at that time, $29, but with today's rate as a comparison $27.

Following are prices per metric ton:

	Fr.	
Basic Bessemer ingots	525	$24.20
Blooms	560	26.05
Billets	625	29.10

French works have also advanced prices. Some sellers are offering billets at prices equal at today's exchange to $29.50 f.o.b. Antwerp. Hoops are quoted at 900 fr., or $41.85 per metric ton.

Prices for pig iron have changed but little. It is understood, however, that quotations will be increased shortly. Luxemburg works quote the same prices as Belgian producers, 430 to 435 fr. or about $20.10 delivered consumers' works, or f.o.b. Antwerp. French makers, however, have had to increase their prices in accordance with the rise of 20 fr. (about $1) per ton for French coke. Steel-making iron continues unchanged. No basic Bessemer is available. Production of hematite is small and prices are in accordance with British quotations and British exchange rates. Large quantities of British hematite are being imported and there is an active demand for this grade. Quotations on ordinary East Coast hematite are 108s. c.i.f. Antwerp, $23.55. Fairly large sales of British high manganese pig iron have also been made at about the same price. The British market is firmer and with the exchange at a high level customers are covering their requirements for the next three months.

Steel quotations have not yet changed in proportion to other prices. Quotations were higher last week but were reduced again so that they are at present at the same level as a fortnight ago, which is somewhat lower when expressed in foreign currency. Higher prices are expected, however. Beams are 650 fr. f.o.b. Antwerp and bar iron 700 fr. and higher, $32.55 as a minimum.

The production in Belgium for October with 39 furnaces in operation was as follows: 196,500 metric tons of pig iron; 210,000 metric tons of ingots and 211,000 tons of finished iron and steel. Compared with the figures for September there is an increase in production of about 20,000 tons of ingots and 2400 tons of pig iron. The production of finished steel was also increased by nearly 30,000 tons.

The production of coke amounted during October to 370,000 tons produced with about 200,000 tons of Belgian coal and 295,000 tons of foreign coal. This was about 17,000 tons more than in September and the largest monthly production of the year. Prices for industrial Belgian coke for December will probably range from 192.50 to 195 fr., or about $9.10.

Nominal prices for domestic consumption are given below. The quotations are per metric ton, f.o.b. makers' works. The price expressed in dollars is lower than a fortnight ago as a result of the higher rate of exchange, as base prices are unchanged.

	Fr.	
Commercial iron, No. 2	700	$32.55
Commercial iron, No. 3	725	33.70
Commercial iron, No. 4	775	36.00
Heavy sheets	750	34.90
Thin sheets	1,100	51.15
Bar iron, base	700	32.55
Rails	700	32.55
Heavy joists	650	30.25
Rods	900	42.85
Open-hearth steel: ordinary	700	32.55
Rounds	1,325	61.60
Squares	1,350	62.80
Spring steel	1,300	60.45
Galvanized wires, base	1,450	67.45
Wire nails, base	1,250	58.15

Truscon Steel Co. Shipping to Japan

YOUNGSTOWN, Dec. 10.—The Truscon Steel Co. is now shipping large tonnages of steel building products from its plant at Youngstown to Japan, states President Julius Kahn. Virtually all of this steel is required in reconstruction in Tokio, Yokohama and other sections devastated by the earthquake in September. The Youngstown plant is now filling orders which were on the books of its Japanese subsidiary at the time of the earthquake.

Partial production has commenced at the Japanese plant. Most of the machinery was damaged very little and manufacturing has been resumed in temporary buildings. The company is now shipping materials to rebuild the main factory structure of its plant in Japan, which was partially destroyed.

Plans are likewise being developed to enlarge the Japanese property, inasmuch as the company expects to receive large orders for reinforcing materials for some time.

Italian Iron Industry Depressed

The iron and steel market is depressed and production is stationary, Commercial Attache H. C. MacLean cables the Commerce Department. The demand for automobiles has declined except for low-priced cars, but the Fiat works are resuming their normal schedule on Dec. 1, after temporary reduction to a 40-hr. week.

Agents for American machine tools and other machinery report increased inquiries for American products, following the rise in German prices, which has reduced their competition.

JAPAN TO BUY IN SPRING

Luther Becker of the Department of Commerce Urges Manufacturers to Seek Japanese Trade Through Exporters or Directly

American manufacturers were urged by Luther Becker, chief of the Iron and Steel division of the Department of Commerce, in an address before the Cleveland Foreign Trade Convention on Dec. 12, to prepare their sales campaign far in advance in preparation for active buying of materials and engineering equipment under the permanent plan of reconstruction in the devastated regions of Japan. This buying is expected to start early next year and next spring should see unusual activity in the Japanese market, Mr. Becker said.

In speaking of the scope of reconstruction work, Mr. Becker said: "The Capital Restoration Board, empowered by the Japanese Government to devise and execute plans for the rehabilitation of Tokio, Yokohama and the intervening towns of the devastated area, will study the restoration possibilities of such public works as Government and municipal buildings, docks and harbor facilities, railroads, electric tramways, transformer stations, telegraph and telephone lines, roads, bridges, water works and sewer systems, all of which suffered considerable damage. Serious consideration will most likely be given to the extension of the capital city's elevated railroad in preference to the construction of the proposed subway. Damage to private enterprise in the earthquake area was serious, involving, among other industrial and engineering lines, shipbuilding, steel plates and tubes, electrical equipment and fixtures, steel and copper wire drawing, copper and brass products, wire and hemp rope, sheet galvanizing, enameled ware, metal-working machines, cement, chemicals and fertilizers, glass, cotton and wool, waste silk, paper and publishing and musical instruments. The burden of replacing these industries will fall largely on the individual, with such assistance as the Government is able to give. The reconstruction of Japan's large and important Naval arsenal and shipyard at Yokosuka will come under the supervision of the Naval board.

"Reports from the several committees working under the Capital Restoration Board, including that on city planning, are to be presented to a special session of the Diet, which was called for Dec. 10, to which publicity is to be given according to a promise made by the board. Final settlement, however, of the plans and of the budget to cover expenditures therefor will be carried over to the regular session of this body to convene 15 days later. Out of the deliberations and conclusions reached by the Diet will come a program which will provide for the restriction of industrial areas, the widening of streets, a building code specifying the type and size of buildings, kinds and quality of materials, more economical and efficient methods of construction, fire-prevention measures, etc."

In seeking business in Japan, Mr. Becker pointed out that the manufacturer could deal through the Japanese import houses represented in New York, San Francisco, Seattle and other seaboard centers, through the few American export companies that are firmly established in Japanese trade, or through their own representatives, where possible, companies of dissimilar lines pooling their interests to maintain an office and representative in Japan.

FRENCH MARKET IMPROVES

Ruhr Agreements Produce More Confidence—Rolling Mills Active—Structural Steel for Japan

PARIS, FRANCE, Nov. 30.—A slight change has been noticed during the past two weeks. Following the failure of their price concession policy, producers, in a new endeavor to stimulate activity, increased quotations, pointing to the rise in coke prices of 8 fr. per ton, and higher prices of raw materials because of the exchange.

Improvement in sentiment, however, is the result of the conclusion of agreements with the Ruhr industrialists, which are likely to bring some increase in the coke deliveries and temporary tranquillity. Although the results of these agreements are still uncertain it is felt that it is a new step toward a solution and there is consequently renewed confidence.

Export business is not as satisfactory as during the past months. Some fairly satisfactory business has been concluded with South American markets and Japan. This resulted in the withdrawal of some firms from the market, or in some cases increases in prices.

Coke.—For the first 27 days of November Ruhr supplies of coke were 180,518 tons, or a daily average of 6700 tons. This is about half the pre-occupation figure. It is hoped that this level will be maintained or even increased as a result of the agreements just concluded. The equalization price of metallurgical coke is at 220 fr. for December. Belgian coke is raised 1.50 fr. per ton to 194 fr. for December. British grades are firm and dearer because of the exchange rates on the pound sterling which yesterday was again at 81.18 fr. The A. R. B. E. D. (Luxemburg) has just placed an order for 150,000 tons of coke in England.

Pig Iron.—The pig iron output for October increased and it is believed was maintained in November. Prices are generally firmer, although some producers are still offering slight concessions. The ruling quotations are 400 to 410 fr. and even 415 fr. in exceptional cases. In hematite, the situation is also improved at 425 to 450 fr., f.o.b. works, depending upon the district, the lowest quotations prevailing in the Southwest. For export, Lorraine and Luxemburg find an obstacle to low quotations in the rise of coke and are asking f.o.b. Antwerp 435 to 440 fr. (Belgian).

Ferroalloys.—Low production is causing higher prices, especially in ferrosilicon. As far as ferromanganese is concerned, prices are strongly upward because of the high exchange on the pound sterling; the minimum price is 1,550 fr. for the 76 to 80 per cent Mn. Spiegeleisen, 18 to 20 per cent, is 700 fr. delivered.

Semi-Finished Products.—The market is unstable and prices differ with various plants. Orders are generally scarce, which explains the variation of prices. Domestic and export quotations are as follows per metric ton for basic material:

	F.o.b. Antwerp Fr.	Domestic Fr.
*Ingots	520 to 530	450 to 470
Blooms	540 to 560	490 to 510
Billets	570 to 580	520 to 550
Largets	590 to 600	.....

*Open-hearth, 25 to 30 fr. higher.

Rolled Products.—This market is extremely firm, with orders more numerous and deliveries of 6, 8 and even 10 weeks. In rails, small transactions are recorded. Very few inquiries are noted in beams with prices ranging from 56 to 59 fr. (Sarre and Lorraine). Demand has increased for merchant grades and orders for small shapes have been so numerous that plants are now refusing to quote deliveries for new contracts. The minimum price for large orders is 58 fr. with 63 fr. the maximum. An order for 36,000 tons for Japan has been booked by the Schneider works and one firm in the West region. F.o.b. Antwerp, beams are 650 fr. and bars 700 fr. (Belgian currency).

Sheets.—Large flats and structural sheets are in active demand. Other grades are declining. Large flats are quoted at 62 to 65 fr. per 100 kg.; heavy sheets at 66 to 69 fr.; medium sheets at 75 to 80 fr.; light sheets at 90 to 92 fr. per 100 kg. at works East Lorraine.

French Pig Iron and Steel Output for October

On Nov. 1, of 219 existing blast furnaces, 116 were in blast compared with 111 on Oct. 1, an increase of 3 in the East and 2 in Lorraine; 56 ready for operation against 60 Oct. 1, and 47 under construction or repair, against 48 Oct. 1.

The production of pig iron was 514,230 tons compared with 481,874 tons in September. The steel ingot output was 476,696 tons, against 446,480 tons in September, and included 286,336 tons of basic Bessemer steel and 179,935 tons of open-hearth.

CORPORATION CLOSES CASE

Ends Its Direct Testimony in Basing Point Hearing—Economists Will Testify

WASHINGTON, Dec. 11.—The last chapter in the hearings in the Pittsburgh-plus case was begun here yesterday when the United States Steel Corporation concluded its direct evidence. The Federal Trade Commission through Attorney H. K. Steinhauer then began the presentation of rebuttal evidence. Middle Western States through their legislatures are represented by their attorneys general or other counsel, while the City of Chicago is represented by Assistant Corporation Counsel Leon Hornstein in opposition to the Pittsburgh-plus practice.

It is also the purpose to protest against the plan through evidence by three economists from universities of the country, including William Z. Ripley, of Harvard; Frank Fetter, of Princeton, and John R. Common, of the University of Wisconsin.

The Steel Corporation testimony of yesterday was begun by evidence given by C. S. French, of the *American Metal Market*, who recited the method of marketing non-ferrous metals, including spelter, tin and copper. He stated that copper and spelter are quoted on an f.o.b. basis at the smelters, while tin, an imported product, is generally quoted f.o.b. New York, inasmuch as most of the incoming shipments passed through that port. Statistical statements also were presented by A. V. Winter, of the Illinois Steel Co., and C. K. Winslow, of the Steel Corporation.

"Grotesque" Prices

Testimony was given today by Dr. Fetter. Replying to a question by Mr. Steinhauer, he stated that steel producers in the Pittsburgh district would, under the natural economic law, benefit from what he called the "marginal principle" when shipping to the Chicago territory by getting the Pittsburgh base price plus the full freight rate, granting that Chicago mills were not able to meet the demand. When and how long the Pittsburgh mills could continue to do this under the natural laws, he said, depended upon the reaching of the saturation point of demand at the place of delivery. After this point had been passed, he declared, it ought not to be possible to get the Pittsburgh base price plus the full freight. The result, it was said, would be that the Pittsburgh base would be somewhat lower and the Pittsburgh area pushed out, while the Chicago area in full directions would be pushed in.

Dr. Fetter said that, assuming the Pittsburgh plus plan now is in actual operation, it is a discriminatory practice resulting in the establishment of prices that are "grotesque" to the extent that there is interference with the law of supply and demand. He said that the discriminatory effect of the Pittsburgh plus plan is a terraced discrimination, whereas the law of supply and demand requires that prices be adjusted to production. Dealing with a hypothetical question, he asserted that a series of discriminatory prices inevitably demonstrates the lack of competition, although a discriminatory price may be said to meet competition at a particular point, while evading that competition at a number of other points.

The attorneys for the Steel Corporation are C. S. Severance and W. W. Corlett, while the attorney for the commission is H. K. Steinhauer. It is expected that the present proceeding will last throughout the present week and the greater part of next week.

The Hearing at Buffalo

BUFFALO, Dec. 10.—To expedite hearings before the Federal Trade Commission on the Bethlehem-Midvale merger, Examiner George McCorkle held evening sessions last week.

Buffalo fabricators furnished most of the testimony. Examination of several witnesses was along the same lines that marked earlier examinations and nothing new has been brought out.

John J. Sullivan, manager of the Henry N. Allen Forging Corporation, Auburn, N. Y., testified that since Jan. 1 this year there was more competition along other lines than on bar tonnages. After examination touching on the various steel concerns from which witness made purchases, Mr. Sullivan said that in the purchases of forgings deliveries were the most important consideration in determining whether he bought from one concern or another. William C. Hoffman, secretary and treasurer, Erie Steel Construction Co., Erie, Pa., said he had no complaint to make of prices or deliveries since October, 1922.

George S. Kellogg, president Kellogg Steel Corporation, Buffalo, testified Thursday and Friday. More than 700 exhibits dealing with purchases by the Kellogg company from a number of steel mills were introduced. Mr. Kellogg said a wider variation in prices existed since the war than prior to 1917. Stewart M. Carroll and Harry H. Elmer, the former purchasing agent and the latter general manager of the Malleable Iron & Steel Co., Syracuse, testified as to purchases of drop forgings and large size flats. George R. Feine, president August Feine & Sons Co., Buffalo, testified that the falling off in demand this year had not brought about reductions in prices such as he could expect.

LITTLE EXPORT BUYING

France and Belgium Booking Small Orders and Possibly 12,000 Tons of Rails for Chile

NEW YORK, Dec. 11.—But little activity is noted in any foreign markets. South American business continues chiefly for small lots. The Chinese market is dull, the principal inquiry being for wire shorts, which are difficult to obtain in any quantities, and second-hand material. On both grades Chinese price ideas are, as a rule, low. Usually $26 per ton, c.i.f. Chinese port, is about the best offer made by merchants on second-hand material, which, in the face of an upward movement in the domestic scrap market, almost precludes any business.

The Japanese market is extremely quiet, no action by the Government yet being noted and the few small orders being placed by merchants apparently going to Belgium or France at lower than the prices quoted by American mills. Some slight activity in purchases of sulphate of ammonia has recently appeared.

Any possibility of importing rails from Europe is considerably discounted by importers, who have in the past made offers to railroads in the United States. It is reported that the rail tender of the Chilean State Railways, which called for about 12,000 tons of 100-lb. rails, will probably be awarded to a Belgian mill.

North African iron ore, low in phosphorus, continues firm at 11c. per unit, c.i.f. port. Caucasian manganese ore is more active than recently and the price shows an increase to 40c. per unit for the ordinary and 42c. for the washed. An importer who represents mines of the Caucasus has closed on 30,000 tons of manganese ore, for delivery over the first half of 1924 to two furnaces in eastern Pennsylvania, 15,000 tons to each consumer.

Arrangements have been made between the Westinghouse Electric & Mfg. Co. and Japanese electrical interests for the formation of a Japanese electric manufacturing company, according to statements from Gen. Guy E. Tripp, chairman of the Westinghouse Electric & Mfg. Co., and L. A. Osborne, president of the Westinghouse International Co., now in Japan. The new company is to be known as the Mitsubishi Denki Kabushiki Kaisha (Mitsubishi Electric Manufacturing Co.). The Westinghouse company has subscribed for stock in the new company. A third interest will be held by Takata & Co., importers and exporters, with New York office at 30 Church Street, New York, who represent the Westinghouse International Co. in Japan.

The Youngstown Sheet & Tube Co., Youngstown, Ohio, states that it has not purchased 38 pipe-threading machines, as recently reported in THE IRON AGE. It has purchased four from the Pipe Machinery Co., Cleveland, but has not placed the order for the remainder.

TONIC FOR BUSINESS

President Coolidge's Views on Economic Problems Generally Commended

WASHINGTON, Dec. 11.—Striking out courageously, President Coolidge in his message to Congress proposed a legislative program that it is fair to say has received a favorable reaction from the country. To business generally it came as a tonic. Despite criticism that has been made of it from the various blocs in Congress, it is accepted generally as carrying some features that even the so-called Progressives have been unable to condemn entirely. This is especially true of the taxation program, which is a full indorsement of recommendations made by Secretary Mellon. This program would mean a reduction in taxes from the highest to the lowest taxpayer and consequently it has carried a wide appeal to the country. Whatever Congress may do, it is believed that if it actually does enact any legislation of importance, instead of finding itself in a deadlock, as seems likely in many instances at least, it will have to accept the soundness of a portion of the taxation program. There already has developed much antagonism among so-called Progressives to reducing the surtaxes and an effort to restore excess profits taxes, but the proposed reduction in normal taxes along the lines suggested by the Administration does not promise to meet a great deal of opposition, although if legislation is enacted, it may modify the Administration program to some extent.

The opposition of the President to a bonus for legislation was outspoken and met with the expected criticism in Congress. There is such strong support for a bonus in the House that it is sufficient to override a veto of the President, but there is doubt as to how the Senate would vote.

The President also has been criticised by members of the farm bloc for confining proposed aid to the agricultural community to that which can be furnished by present agencies like the War Finance Corporation, but without further use of public funds or price fixing. His proposal to prohibit tax-exempt securities apparently has met with no great protest. Continued restriction of immigration along the lines the President suggested also has been proposed in bills introduced, and it is conceivable that such legislation will be enacted. His opposition to tariff tinkering is thought to indicate that nothing will be seriously attempted to change tariff duties by legislation, although the farm bloc may make a drive for political effect to increase duties on wheat and perhaps other agricultural products.

Secretary Mellon's Views on Railroad Buying and Taxes

WASHINGTON, Dec. 11.—In looking forward to 1924 it appears that the factors which have been most influential in the revival that has taken place are likely to remain effective, at least in considerable degree, is the opinion of Secretary of Treasury Mellon as expressed in his annual report. He says:

It may be that the country will not build as many dwelling houses or freight cars as in 1923, but there is reason to believe that much construction work is under consideration and with stable conditions will go forward. The attitude and circumstances of the railroads will be an important factor in the situation. They are large consumers ordinarily of iron, steel, and all construction materials, and they have not made up in one year the accumulated deficit in construction since the beginning of the war. The country has benefited in marked degree during the past year, not only from the direct effects of their liberal expenditure upon the employment situation but from the results in improved transportation service. There is one unsatisfactory feature about the large capital outlays upon the railroads in the past year, and that is that they have been almost wholly provided by borrowing and are represented by bond issues. It is evident that the railroads can not be permanently financed in this manner. Unless a proportion of the new capital is provided in the form of proprietary investment, the credit of the companies will suffer, interest rates upon their offerings will have to be advanced, and in the end further borrowing will become impracticable. The public is interested in maintaining the credit and the service of the roads, and especially interested now that their expenditures shall be in 1924, as in 1923, a strong supporting element in the general employment and business situation. The companies have been operating this year under conditions more than ordinarily favorable to earnings, owing to the heavy volume of traffic, but they have not prospered alike in all sections of the country.

Dealing with the increasing burden of local taxation, the Secretary of Treasury says that these taxes are affecting land values unfavorably and in this causing a state of discontent which does not always place the blame where it belongs. One cause of these high local taxes, he says, is to be found in the borrowing of local branches of Government, stimulated by the ready market for tax-exempt securities, resulting from the high surtaxes upon incomes. The statistics of local indebtedness show that the interest burden is becoming a very serious one in local budgets.

Mr. Mellon strongly recommends reduction in taxes along the precise lines he set forth in a recent letter to Chairman Green of the House Committee on Ways and Means, and which has been detailed in THE IRON AGE. At the same time, he opposes bonus legislation.

Annual Oakite Sales Conference

The seventh annual sales conference of the Oakley Chemical Co., held in New York, Dec. 3, 4 and 5, brought to its offices at 22 Thames Street the 70 members of its field organization. In the three days seven sessions amounting to a total of 20 hours were devoted to papers and discussions on the selling methods of the company and to its handling of the cleaning problems of various industries. Four of the papers related to the metal working industries and one to power plant equipment. Tuesday night, Dec. 4, was given up to entertainment and Wednesday night to the annual banquet. C. F. Radley, editor of the Oakite News Service, was the toastmaster. Among the features were the presentation of prizes for the best story written by a salesman on "My Most Difficult Sale" and the awarding of handsomely engrossed testimonials to the salesmen who during the year succeeded in selling every prospect in a town in their territory. Inspirational addresses were made by David C. Ball, president of the company; Daniel C. Smith, vice-president; David S. Ball, assistant manager, and Fred A. Aston, senior district manager.

Institute of Weights and Measures

At the annual meeting of the American Institute of Weights and Measures, held Dec. 6 at the Engineering Societies Building, New York, the president, W. R. Ingalls, announced the election by letter ballot of the following as members of the council of the Institute for the ensuing three years: George N. Bond, specialist in precision measurement; Robert H. Irons, president, Central Iron & Steel Co.; H. J. Horn, John A. Roebling's Sons Co.; H. N. Covell, works manager, Lidgerwood Mfg. Co.; A. R. Erskine, president, Studebaker Corporation; J. B. Ennis, vice-president, American Locomotive Co.; Herbert E. Cushman, treasurer and general manager, Morse Twist Drill & Machine Co.

Year's Car Loadings May Reach 50,000,000

On the basis of the loading of revenue freight through Nov. 24, the American Railway Association estimates that the total loadings for the year will exceed 50,000,000 cars. This is the largest number in history and exceeds by 2½ per cent the estimate for the year which was made early last spring. For the most recent 38 weeks, beginning March 10 and ending Nov. 24, the average has been more than 1,000,000 cars per week. In 21 weeks the figure exceeded 1,000,000.

NOVEMBER STEEL OUTPUT

Production Rate 11,644 Tons a Day Below That of October

The output of steel ingots in the United States in November declined nearly 9 per cent from that in October and compares with a falling off in the previous month of less than 1 per cent from September. The statistics of the American Iron and Steel Institute indicate a daily rate last month of 119,762 gross tons, as compared with a daily average of 131,406 tons in October, the decrease being 11,644 tons a day. In October the decline from September was only 1241 tons per day.

The November output of companies which made 95.35 per cent of the country's total in 1922 was 2,969,012 tons which, assuming that the 4.65 per cent not reporting produced the same percentage of the total as in 1922, points to a total November output of 3,113,804 tons.

The table below gives the production by months for 1923 of the different kinds of steel, together with estimated daily rate for all companies. Following it is a table showing the production by months in 1922.

Monthly Production of Steel Ingots, January, 1923, to October, 1923, Reported for 1923 by Companies Which Made 95.35 Per Cent of the Steel Ingot Production in 1922

Months 1923	Open-hearth	Bessemer	All Other	Calculated Monthly Production All Companies	Approximate Daily Production All Companies, Gross Tons
Jan. ...	2,906,892	728,270	9,467	3,822,369	141,569
Feb. ...	2,613,564	669,903	10,797	3,454,918	143,955
March ..	3,046,309	799,525	12,841	4,046,854	149,883
April ..	2,974,579	772,485	13,933	3,944,412	157,776
May ...	3,136,558	847,418	16,719	4,195,800	155,400
June ...	2,821,239	737,845	15,483	3,748,890	144,188
July ...	2,658,449	680,884	11,496	3,514,241	140,570
Aug. ...	2,796,370	701,059	9,326	3,677,771	136,214
Sept. ...	2,539,653*	613,709	8,602	3,316,166*	132,647*
Oct.	2,724,371	649,452	9,163	3,547,966	131,406
Nov. ...	2,343,368	616,335	9,309	3,113,804	119,762
11 mo..	30,561,352	7,816,885	127,136	40,383,191	141,200

*Revised.

Monthly Production of Steel Ingots, January, 1922, to December, 1922, Reported by Companies Which Made 84.15 Per Cent of the Steel Ingot Production in 1922

Months 1922	Open-hearth	Bessemer	All Other	Calculated Monthly Production All Companies	Approximate Daily Production All Companies, Gross Tons
Jan. ...	1,260,809	331,851	822	1,891,857	72,764
Feb. ...	1,395,835	348,571	616	2,071,772	86,324
March ..	1,918,570	451,386	795	2,814,667	104,247
April ..	1,997,465	445,939	1,109	2,902,240	116,090
May ...	2,214,774	494,893	1,474	3,218,794	119,215
June ...	2,143,708	487,851	2,918	3,127,775	120,299
July ...	2,020,572	464,047	2,485	2,952,806	118,112
Aug. ...	1,807,310	404,379	2,893	2,629,256	97,380
Sept. ...	1,911,147	460,127	2,505	2,818,261	108,395
Oct.	2,352,207	518,010	2,198	3,410,265	131,164
Nov. ...	2,360,903	525,945	2,449	3,430,309	131,935
Dec. ...	2,241,104	536,214	2,572	3,300,416	132,017
Total..	23,624,404	5,469,213	22,836	34,568,418	111,511

Eyesight Conservation in Industry

Twenty-nine thousand employees of the Ford Motor Co. have defective vision, according to a report made by that company to the Eye Sight Conservation Council of America, which is conducting a survey of eyesight conditions among the nation's industries.

The present number of employees of the Ford Motor Co. at Detroit is 65,000. Of this number, 60,000 have received eye examinations, and of these 31,000 were found to have normal vision, and 29,000 defective vision. Although very high, it is thought that the percentage of defective vision would still be higher if more complete eye examinations were made. It is not considered necessary to do this except in special cases.

The company first started tests for sight in 1912. Employees with poor vision are placed on jobs where there is no risk of injury or other conditions that would make his eyesight worse. A careful job analysis has been made throughout the plant for the purpose of determining what jobs are suitable for those with poor eyesight.

The E. I. du Pont de Nemours & Co., Wilmington, Del., reported the adoption of a system of eye conservation, eye examinations having been started at the Wilmington plant five years ago. At the dye works eye protection is promoted by a works safety committee and penalties are imposed for failure to comply with the rules issued. The eye accident reduction rate for the period during which the eye protection campaign has been functioning is reported to be 66 2-3 per cent. There were only three lost time eye accidents during the first six months of 1923.

Modern equipment is used to provide proper lighting, and full advantage is taken of daylight wherever possible. When thought of advantage, walls and ceilings are painted to improve light conditions.

Steel Corporation's Orders Decline

Unfilled business on the books of the United States Steel Corporation, as of Nov. 30, amounted to 4,368,584 tons, or 304,241 tons less than reported for Oct. 31. During October, unfilled orders fell off 362,925 tons; in September, 378,913 tons; in August, 496,100 tons; in July, 475,498 tons; in June, 595,090 tons; in May, 307,158 tons and in April, 114,823 tons; while in March they increased 119,343 tons; in February, 373,213 tons and in January, 165,073 tons. A year ago the unfilled tonnage was 6,840,242, or 2,471,658 tons more than on Nov. 30 last. Following is the unfilled tonnage as reported by months since January, 1920:

		1923	1922	1921	1920
Jan.	31.....	6,910,776	4,241,678	7,573,164	9,285,441
Feb.	28.....	7,283,989	4,141,069	6,933,867	9,502,081
March	31.....	7,405,332	4,494,148	6,284,765	9,892,075
April	30.....	7,288,509	5,096,913	5,845,224	10,359,747
May	31.....	6,981,351	5,254,228	5,482,487	10,940,465
June	30.....	6,386,261	5,635,531	5,117,868	10,978,817
July	31.....	5,910,763	5,776,161	4,830,324	11,118,468
Aug.	31.....	5,414,663	5,950,105	4,531,926	10,805,038
Sept.	30.....	5,035,750	6,691,607	4,560,670	10,374,804
Oct.	31.....	4,672,825	6,902,287	4,286,829	9,836,852
Nov.	30.....	4,368,584	6,840,242	4,250,542	9,021,481
Dec.	31.....	.....	6,745,703	4,268,414	8,148,122

The largest total of unfilled orders was on April 30, 1917, at 12,183,083 tons. The lowest was on Dec. 31, 1910, at 2,605,747 tons.

Vickers, Ltd., and International Combustion Engineering Corporation Combine

George E. Learnard, president International Combustion Engineering Corporation, New York, who has just returned from England, announces that negotiations which have been going on for several months between Vickers Ltd. and International Combustion Engineering Corporation for the joining of these two interests in the manufacture of power plant equipment have been successfully concluded. A new company will be immediately registered in England under the name Vickers & International Combustion Engineering Ltd. with an initial capital of £500,000. All of the stock is owned in equal shares by the two companies.

The plant of the new company is situated at Barrow-in-Furness, England, and it will commence immediately the manufacture in its own works of boilers especially adapted for the burning of coal in pulverized form, superheaters, economizers, Raymond impact pulverizers, dryers, air heaters and other auxiliary equipment.

The new company will specialize in the designing, building and equipping of complete power plants, all units of which can be manufactured by the new company and by other companies affiliated with Vickers Ltd. or International Combustion Engineering Corporation.

The directors of the new company are: Sir Trevor Dawson, London, England, deputy chairman and managing director of Vickers Ltd., chairman of new company; George R. T. Taylor, managing director Taylor Brothers Ltd., Leeds and Manchester, England (a Vickers subsidiary), managing director of new company; George E. Learnard, president International Combustion Engineering Corporation; Wilfred R. Wood, vice-president International Combustion Engineering Corporation.

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Why the Foundries Bought Pig Iron

COMMENT on the recent buying movement in pig iron has taken a considerable range. In some of the financial columns of the daily press it has been pointed to as the prelude to a revival in business, following many weeks of abstemious buying and of contracting business in a number of lines of trade.

Over against such opinion has been the view that as pig iron had been declining for seven months under heavy production and continued accumulation of stocks, the time came when some sellers were willing to take less than their cost in order to lighten their load; that consumers, recognizing that bargains were going, took on iron for at least part of their probable wants in the first quarter of 1924, believing that with such low-priced pig iron the prices they were likely to get for their own products would show at least a fair profit.

Again it has been pointed out that the buying was not speculative; that while the prices were low enough to be attractive, consumers had real business in hand and had to have pig iron.

It is probably the fact that more than one factor entered into the simultaneous decisions of so many users of foundry iron to buy pig iron for delivery in the first quarter of the new year. The pig iron offered was bargain iron, and it was also true that for a good many foundrymen it was time to buy. They might have gone on for some time further, buying sparingly in view of the long drawn out decline. But while some furnacemen had explained that the pig iron price was at their cost line when the market was several dollars a ton higher, enough was known of the costs of furnaces well situated, and owning at least some of their raw materials, to justify the claim that at last the cost line of some of the fittest producers had been reached. What was likely, if buyers continued to hold off, was a more drastic reduction of output and a little later a rush to cover, when it appeared that production was well below the rate of consumption.

The statistics of pig iron production and stocks had been running for months in favor of the buyer. In May of this year the country was producing pig iron at the rate of 45,000,000 tons a year (although 39,400,000 tons in 1916 is the best year's record) and merchant pig iron was a much larger percentage of the total than it had been at any time in the year previous. As between steel-working and merchant pig iron the situation in May of this year and in May of 1922 was this:

	Daily Output Steel-Making Iron, Gross Tons	Daily Output Merchant Iron, Gross Tons
May, 1923.....	96,000	28,700
May, 1922.....	60,600	13,800

Thus, while steel-making iron was produced last May at a rate 60 per cent greater than in May, 1922, the increase in merchant pig iron production was more than 100 per cent. It was well known that foundry operations had not expanded in the year to the same extent as those of industries using finished steel. Hence the months of careful buying of pig iron by foundries, after the production peak in May, were due to the full knowledge by foundry operators that their raw material was in oversupply and to the further fact that the iron the foundries had bought under the somewhat feverish conditions of last spring would carry them further toward the end of the year than they thought when they bought it.

A million tons of pig iron is by no means enough to carry our foundries through a three months' operation, even on the present scale of production of iron castings. After the way in which they kept out of the market between April and November, the presumption is that many of them will yet need a good deal of iron for the first quarter of 1924 even if they make no increase upon the rate at which they are producing today.

INDIA'S iron and steel industry is comparatively new, but good progress has been made in its development, particularly in finished steel products for export. According to the latest official figures exports had practically doubled to August this year. In 1913 India's outer trade in steel amounted to 8700 gross tons per month and in 1922 to 8300 tons per month. But for the first seven months of this year exports were about 17,000 tons per month, with the May and June fig-

ures at 22,300 tons and 20,500 tons respectively. India's steel plants enjoy such advantages in costs and location as will make their competition with the larger steel-producing countries increasingly felt in the future.

Record World Tin Plate Demand

WHILE steel exports from the United States this year have been at a low rate, the movement of tin plate has been a good deal larger than in 1912, 1913 or 1922. This is undoubtedly a contributing cause of the steadiness of the tin plate market. In 1913 our exports of that product were 6100 gross tons per month; to Nov. 1, this year, they have been over 50 per cent larger at 9220 tons per month, a figure exceeded only in the halcyon post-war years, 1919 and 1920, when other nations were unable to export. But the rising tide in foreign demand is not confined to American tin plates—British sales have mounted to a volume unequaled in the last ten years. For the first ten months of this year the British exports were 45,400 tons per month, against 41,200 tons per month in 1913. Last October they were 51,400 tons. A record is being established, therefore, in the world demand for tin plate as judged by the combined British and American exports. The actual average is 54,620 tons per month to Nov. 1, as the exports of the two nations, against 47,300 tons per month in 1913. In other words, the world demand for tin plate is about 7000 tons per month larger now than before the war. It is also greater than for any year in the last decade.

Cycles in the Iron Trade

IN the annual statistical report of the American Iron and Steel Association for 1886, the late James M. Swank drew attention to the great ups and downs of the iron trade. At another time Mr. Swank used the expression "feast or famine," while Andrew Carnegie's "prince or pauper" reference is quite celebrated.

Just before the war there was the popular impression that the steel trade had been growing steadier, over a period of years. Statistical comparisons, covering both rates of production at various times as well as market prices, did not fully confirm the popular view, but gave it some support.

The history of the past eight or ten years presents no direct evidence that the industry has become more stabilized. There have been very remarkable swings in both prices and production. This, however, is no test. A greater disturbance occurred in the period than had ever occurred before. There was not only the war, but the peculiar conditions after the war, when men did not know just where to find themselves. They had lost the normal for comparison and were unable to set up a new normal. That there have been great fluctuations in recent years does not, therefore, prove that the general swing over a long period is not toward a condition of less instability.

It is to be assumed that men profit by experience. The greater experience they have had, the longer the history of great ups and downs in iron and steel, the more men are going to avoid being carried away, the more likely they are to regard the existing condition as one that is to be succeeded by the reverse condition.

The result of such mental attitudes is that a stabilizing or damping influence is exercised. When prices advance sharply men are less disposed than formerly to regard the new level as permanent, and the same with declines. Among sellers there is less disposition to push prices up and less disposition to allow them to sag. Plainly the tendency of the industry toward consolidation makes it more likely that extremes will be avoided.

Perhaps it would be entirely true to assert that this tendency toward more stable conditions in steel has been exemplified in the past year. Steel prices were not advanced early in the year as far as they could have been, while on the other hand the expectation of declines in the summer and fall was so strong that the common remark lately has been that the steel market is much better than was expected.

Taxation and Enterprise

SECRETARY MELLON'S plan for reduction of Federal taxes and revision of the system has met with a widespread and enthusiastic commendation that has rarely been accorded the recommendation of any Government official in the history of the country. In his report to Congress the Secretary of the Treasury sets forth plainly the reasons why the proposed changes should be made.

Society has so constituted itself to supply its material needs that its work is done on a large scale, requiring directing heads and the subdivision of labor. Thus progress is made. The entrepreneur and capitalist put better tools in the hands of workmen; thereby the workmen accomplish more and all benefit.

It cannot be argued that there is merely so much capital in the country and that the capital will find investment, no matter what the Government does. This is not true, in the first place, but even if it were true it is easily seen that taxation has much to do with the placing of capital. To consider the matter only from one angle, but the most important one, there are the tax-exempt securities, chiefly of States and municipalities, which Secretary Mellon reports amount to about $11,000,000,000. They exist and they have to be owned by somebody.

Does it matter who owns these securities? It certainly does. They represent improvements that would be made in any event. The State or the municipality has its own ideas as to what improvements should be made, and has engineers to carry out the ideas. The owners of the securities involved have nothing to say about it. They may just as well be private citizens—even widows—of limited means. If they invest their small capital otherwise they cannot initiate, plan and direct. The diminishing number and amount of large taxable incomes year by year show how these tax-free bonds have moved into the hands of men having large wealth, who show by that

fact that they have ability to initiate, plan and direct. The number of taxable incomes over $300,000 has decreased year by year at a remarkable rate, except for 1920, and the total of such incomes has decreased except in 1919 and 1920, which showed increases. Both number and total were smallest for 1921.

These men of capital, fitted to plan and direct, to initiate and to carry through enterprises which would be of great economic benefit to the country, placing better tools in the hands of workmen and giving the country better goods and better service, have become the owners of tax-exempt securities, in connection with which their ability does not count, and the capital is thus removed from productive enterprise.

To reduce the surtaxes is to bring out more capital for development, for productive enterprises. Thus to increase the prosperity of the country is the plain duty of a wise government. Thereby, as Secretary Mellon suggests, the amount received in taxes may even increase. It is like a landlord improving the property so that the tenant's income will increase and a reduced percentage of his income will still make a higher rent.

Bonuses to the Ex-Soldiers

ALREADY the so-called soldier bonus is looming up as a leading issue in this session of Congress. From the bill the last Congress passed granting the bonus we were saved only by the President's veto. Up to a few weeks ago it seemed likely that the present Congress would again be strong for it, and with a new President would take a chance respecting him. But Secretary Mellon with his proposal for tax reduction has introduced a new feature that is highly embarrassing to the politicians by virtue of the popular reaction it has produced.

It has been represented that the last Congress acted as it did out of fear of the American Legion; also that if it were shown by the referendum some of the veterans are trying to bring about that a majority of them are opposed to the measure Congress would lose all fear of the American Legion and would protect the taxpayers.

The above idea is plausible, and not long ago we might have believed it. The result of the recent election in the State of New York, however, affords food for more thought on this subject. In that election a large vote was cast on a number of constitutional amendments and the people evidently exercised discrimination, for some they voted down (including one bad one) and others they enacted. We deduce therefrom that the voters of New York knew what they were doing, or (better said) they gave some thought to it.

Among the amendments enacted was one authorizing the issuance of $45,000,000 of bonds to raise money for the payment of a State bonus to former soldiers. It is clear from this action that a majority of the voters of New York State want to give a bonus, just as the people of other States have done. Certainly they were cringing under no lash in the hands of the veterans, as a legislature of politicians might be supposed to do. It is a reasonable inference, therefore, that Congress itself is strong for the bonus, not out of ear of the American Legion, but rather out of sensing that a majority of the voters want to give it.

In making this diagnosis we are in no way intimating that the voters ought to want to give these bonuses. On the contrary, the desire is reprehensible. The levity with which the people of the State of New York voted a great sum of money as a bonus to a few, which must come out of the taxpayers, is shocking. It is to be feared that there is a similar unconcern among us nationally.

We have been saved so far from the perpetration of this economic crime by the efforts of such leaders as Senator Smoot, Secretary Mellon and the lamented President, but they have expressed their opposition on the grounds that the treasury did not have the means and that there should be no bonus unless Congress provided for it by new taxation. They have not come out, nor has anyone else, speaking with the voice of authority, with a declaration that the bonus should not be granted for the simple reason that it is bad. What ought to be said further is that it is vicious to take money from some people in order to give it to a few; that the contention of some of the veterans for "adjusted compensation" has no merit; that if a mechanic drafted into the military service lost the chance for inflated wages that were enjoyed by the mechanics who escaped, the unfairness was in the stay-at-homes getting too much, not in the soldiers getting too little.

The war did not enrich this nation as a whole, but rather did it act oppositely. It did, to be sure, produce economic unbalances, whereby certain classes of wage earners profited greatly at the expense of capitalists and other classes of wage earners. That some wage earners in rendering patriotic service lost their opportunity to participate in such profiteering is no sound reason that *ex post facto* they should be granted a sop. The war profits of corporations were largely taken away from them immediately through excess profit taxes. What was not taken away and what looked like profit was largely no such thing, but was investment in excess plant that was destined to be thrown away. A sop to the ex-soldiers can come from nowhere but out of what the taxpayers of the country are currently earning. It can do nothing but produce the economic evil of taking a portion of the produce earned by some people and giving it to others who have not earned it, which is not to minimize the gratitude that the country owes to its soldiers, although it might be mentioned that there are millions of other men who served patriotically even if not in uniforms.

Whether the money for the bonus be found by direct taxation or by bond issues the principle is the same and so will be the results. The majority of the people of the country do not understand this. It is the duty of their political leaders to instruct them. That is what leaders are for, or it ought to be. Is it not true, too, that a large part of the press is derelict?

It is a foolish adage that the voice of the people is the voice of God. Instead of the voice of the people being the voice of God there are many

popular voices, which are quickly changeable. Secretary Mellon has shrewdly presented the people something that they can understand. In submitting to them the question whether they prefer to save money in their direct taxes, or to continue to pay high taxes and give the money to the ex-soldiers, he has developed a clear-cut issue. With such a one even the people of New York might have voted differently last November. We hope, however, that in the debates in Congress there will be some great leaders who will make it clear that there ought not to be a soldier bonus, simply because it would be wrong.

THE vicissitudes of promoting legislation are well illustrated in the efforts of several years to secure among the States steam boiler inspection statutes conforming to the boiler code of the American Society of Mechanical Engineers. Progress has been made, but seemingly adoption by some States is no promise whatever that the way is made easy to get prompt and favorable consideration in other States. Experiences of the past year bring into relief not only the need of perseverance but the call for forbearance. In Indiana, after smoothing out a number of legislative tangles, the engineer sponsors of country-wide harmonious boiler laws were chagrined to discover that a bill that finally passed both houses failed of the legal signing by the governor of the State because the clerk overlooked certifying the bill before final adjournment. In Kansas, because a bill provided for making an appeal to the apparently odious industrial court, any prospect of consideration was doomed. In Iowa, the use of the name engineer was sufficient to cause the withdrawal of the bill. Clearly a sense of humor as well as enthusiasm is required in one who would be coadjutor to the legislator.

CORRESPONDENCE

Electric Furnace for Melting Brass

To the Editor: We read with interest Mr. Leonard W. Egan's article on Electric Furnaces, in the Nov. 8 issue of THE IRON AGE.

In his discussion of the muffled arc furnace as developed by the General Electric Co. he stated that, for red brass of 80 per cent copper, 20 per cent zinc, the consumption on daylight melting is 470 kwhr. per ton. We have been operating a furnace of that type for three years and it might be interesting to note that we averaged 613 kwhr. per ton on a run of 1,305,530 lb. On another occasion we averaged 617 kwhr. on a run of 986,552 lb. We melted metal of the following composition: copper, 77 per cent; tin, 3 per cent; lead, 10 per cent, and zinc, 10 per cent.

This melting was done with the best practice known to the General Electric Co. and ourselves, and also under the partial supervision of the General Electric Co. In spite of the aforementioned, and the fact that we were melting an alloy of lower copper content, we were unable to approach Mr. Egan's figure of 470 kwhr. per ton. Hence it would be of interest to know how he obtained these results.

He also claims one of the advantages of the furnace to be the freedom of agitation of the bath. Anyone with experience in melting leaded alloys realizes the possibility—in fact, it is past the possibility stage; it is a reality—of the lead segregating to the bottom of the bath. The bath must be continuously rabbled in order to get uniform metal. So really freedom of the bath from agitation is a disadvantage and not an advantage.

F. L. WOLF,
Technical Superintendent.
WILLIAM ROMANOFF,
Metallurgist.

Ohio Brass Co.,
Mansfield, Ohio,
Dec. 4.

Permanent-Mold Casting of Aluminum Alloys

A study of the state of the art in the production of aluminum castings by the permanent-mold process has been made by the Department of the Interior at the Pittsburgh experiment station of the Bureau of Mines. Experimental work undertaken some time ago on the gating of aluminum alloy pistons on casting in permanent molds has been completed. It has been shown that the occurrence of blow-holes and related defects can be controlled by proper gating and pouring practice.

BRITISH FOREIGN TRADE

October Exports Second Largest for the Year—Imports Declining

Exports of iron and steel from Great Britain in October at 401,475 gross tons were second only to the 435,630 tons of May. They were about 57,000 larger than the September exports. October imports were 117,372 tons or one of the smallest for the year thus far and about 10,500 tons less than those for September. These data all include scrap iron and steel. Comparative data for both exports and imports are as follows:

British Steel Exports and Imports, Gross Tons

	Exports	Imports
Aver. per month, first quarter, 1923...	358,208	128,032
Aver. per month, second quarter, 1923..	402,471	126,042
July, 1923	314,522	128,486
August, 1923	330,431	121,906
September, 1923	344,358	127,893
Aver. per month, third quarter, 1923...	329,770	126,095
October, 1923	401,475	117,372
Average per month, 1922	295,980	82,215
Average per month, 1921	144,885	152,734
Average per month, 1920	274,881	128,685
Average per month, 1919	188,519	50,801
Average per month, 1913	420,757	195,264

More detailed data of the exports are as follows:

Principal British Exports, Gross Tons per Month

	1913	1922	October 1922	October 1923
Pig iron } Ferroalloys }	93,700	66,159	119,288 / 10,671	54,829 / 11,661
Steel rails	42,200	21,300	17,146	21,839
Steel plates	11,200	6,700	6,551	22,580
Galvanized sheets	63,500	43,600	39,487	57,335
Steel bars, rods, etc.	20,900	19,100	22,107	37,075
Tin plates	41,200	37,400	35,125	51,398
Black plates and sheets	11,700	18,700	21,335	27,895

Exports of scrap iron and steel in October were 12,876 tons, or 10,305 tons per month for the first 10 months of this year, as compared with 12,880 tons per month in 1922. In 1913 there were 9600 tons per month.

Data as to importations of importance are as follows in tons per month:

	1913	1922	Jan.-Oct., 1923
Iron ore	620,000	289,400	493,177
Manganese ore	50,100	28,109	45,426
Pig iron and ferroalloys	18,000	12,800	9,755

The Boston section A. S. M. E. inspected the Watertown Arsenal, Watertown, Mass., shops from 3 until 4 p. m., Dec. 12, and the laboratories from 4 until 6 p. m. In the evening T. C. Dickson, commanding officer, spoke on X-ray examination of metals; Dr. F. C. Langenberg on Investigation of the Influences of Temperature on the Charpy Impact Value of a Group of Steels of Varying Composition; and E. P. Gilligan on Ordnance Department Metal Specifications.

Iron and Steel Markets

SOME FORWARD BUYING

Largely From Automobile Trade

Current Orders Below Shipments—Structural and Railroad Buying Noteworthy

First quarter buying in steel has appeared. It comes largely from the automobile trade, but not from all motor car makers. Some still show doubts of price stability, and low prices evidently were obtained in transactions covering automobile parts.

Sheets, ordinary and alloy steel bars, and forgings were placed in Detroit in liberal quantities that add to the expectations of large automobile production in the early months of 1924. In Cleveland the forward sales of bars totaled between 4000 and 5000 tons with 15,000 tons likely to be settled by the end of the week.

Bookings of steel in general are up to the volume of the corresponding period of November, though still below shipments. Mill operations, if anything, have increased. The Steel Corporation's schedule appears to call for somewhat over 84 per cent of ingot capacity, against 81 or 82 a week ago, but indications are that the industry as a whole is not over 70 per cent.

Some of the sheet sales are for less than three months, but few deliveries are wanted until after inventory taking. The result is that there are mills asking 2.85c. on orders for next year which will enter immediate business at 2.75c. Prices of automobile body sheets are holding firm after efforts to depress them $5 a ton. Inquiries for sheet bars are considerable and with the Steel Corporation regarded as a likely buyer on the large scale it was in 1922, the sheet bar price of $42.50 is considered fully as firm as finished steel.

Pressure for output notably marks the tin plate situation, with some mills now having eight months' work in sight.

With the order of 2000 cars for the Wabash and other car purchases amounting to 500, following the placing of 5000 in the preceding two weeks, the basis of satisfactory negotiations appears to be definitely broadening for the settlement of the large amount of railroad equipment still pending.

New York's unusual winter building activity accounts for most of the week's structural steel awards, 15,600 tons out of a total for the country of about 24,000 tons. Likewise more than half of the new projects reported, totaling 23,000 tons, are from New York. A decided gain in inquiry is reported from the Central West.

Price stabilization in cold-finished steel bars has been interfered with somewhat by a Chicago producer's adopting a Chicago instead of a Pittsburgh base. One immediate result has been a $6 reduction in Chicago warehouse prices for shafting.

November steel ingot statistics show, at 3,113,804 tons, or 119,762 tons a day, a decline in production of 9 per cent from the October daily rate, which was down 1 per cent from that of September. In pig iron the corresponding reductions in output were 5 and 2½ per cent, respectively.

The pig iron market has lapsed into profound dullness and neither buyers nor sellers are disposed to enter into contracts for delivery after April 1. The uncertainty as to the price of coke for the second quarter of the new year and the threat of a strike of bituminous miners April 1 will probably continue to retard the buying of pig iron except for immediate requirements. Bessemer iron is stronger in the Pittsburgh district.

Further purchases of heavy melting scrap have been made by the Steel Corporation, and the old material market is stronger in nearly all centers, with numerous price advances.

Contracts for 50 per cent ferrosilicon for 1924 are being taken at $75 per ton, delivered, $1 to $1.50 being added or subtracted as the case may be for each per cent variation. Last year the contract price was $82.50 to $87.50, delivered, with no differential.

A cast-iron pipe shop in France has again taken business in competition with American companies, the city of Pasadena, Cal., having awarded 1000 tons to the French company.

Japanese demand for thin galvanized sheets has dwindled both in the United States and Great Britain.

For 21 successive weeks THE IRON AGE finished steel composite price has stood unchanged at 2.775c. per lb., following 11 weeks at 2.789c. One year ago it was 2.439c.; two years ago, 2.135c.

No change having occurred, THE IRON AGE pig iron composite price remains at $21.88. One year ago it was $25.71; two years ago, $19.46.

Pittsburgh

Steel Prices Firm, Although Plant Operations Are Decreasing

PITTSBURGH, Dec. 11.—The impressive thing about the steel market is its firmness in the face of a demand so moderate that plant operations are decreasing. The end of the year is so near that very little material is wanted and the desire to keep down inventories is strong. While there has been some buying for delivery after Jan. 1, it has not been of that large and confident character that inspires real cheerfulness. The market, however, has withstood repeated efforts on the part of buyers to secure plates, shapes and bars at less than quotations, and the past week has seen a further thinning of the ranks of sheet manufacturers accepting business at below the Steel Corporation schedules. Price stabilization effort in cold-finished steel bars and shafting has been somewhat interfered with by the action of a Chicago producer in adopting a Chicago instead of a Pittsburgh base.

Some fresh signs of irregularity and weakness have cropped out in strips, but, as against this, is a further decrease in the number of bolt, nut and rivet manufacturers willing to go below quoted prices to secure orders. There are no suggestions of price cutting in pipe or wire goods, and the maintenance of tin plate prices

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Dec. 11, 1923	Dec. 4, 1923	Nov. 13, 1923	Dec. 12, 1922
No. 2X, Philadelphia‡	$24.96	$24.96	$22.64	$28.76
No. 2, Valley furnace†	22.00	22.00	22.00	25.00
No. 2, Southern, Cin'ti†	25.05	25.05	23.05	26.55
No. 2, Birmingham, Ala.†	21.00	21.00	19.00	22.50
No. 2 foundry, Chicago*	23.00	23.00	22.50	28.00
Basic, del'd, eastern Pa.	**23.25**	22.75	23.00	27.50
Basic, Valley furnace	21.00	21.00	20.50	25.00
Valley Bessemer, del. P'gh.	**24.76**	24.26	26.26	29.27
Malleable, Chicago*	23.00	23.00	22.50	28.00
Malleable, Valley	20.00	20.00	20.00	26.00
Gray forge, Pittsburgh	23.26	23.26	23.26	26.77
L. S. charcoal, Chicago	29.15	29.15	28.15	36.15
Ferromanganese, furnace	107.50	107.50	110.00	100.00

Rails, Billets, Etc., Per Gross Ton:				
O.-h. rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Bess. billets, Pittsburgh	40.00	40.00	40.00	36.50
O.-h. billets, Pittsburgh	40.00	40.00	40.00	36.50
O.-h. sheet bars, P'gh.	42.50	42.50	42.50	36.50
Forging billets, base, P'gh.	45.00	45.00	45.00	45.00
O.-h. billets, Phila.	45.17	45.17	45.17	43.17
Wire rods, Pittsburgh	51.00	51.00	51.00	45.00
	Cents	Cents	Cents	Cents
Skelp, gr. steel, P'gh, lb.	2.35	2.35	2.40	2.00
Light rails at mill	2.25	2.25	2.25	2.15

Finished Iron and Steel, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.67	2.67	2.67	2.275
Iron bars, Chicago	2.40	2.40	2.40	2.35
Steel bars, Pittsburgh	2.40	2.40	2.40	2.00
Steel bars, Chicago	2.50	2.50	2.50	2.10
Steel bars, New York	2.74	2.74	2.74	2.34
Tank plates, Pittsburgh	2.50	2.50	2.50	1.95
Tank plates, Chicago	2.60	2.60	2.60	2.30
Tank plates, New York	2.74	2.74	2.74	2.29
Beams, Pittsburgh	2.50	2.50	2.50	2.00
Beams, Chicago	2.60	2.60	2.60	2.20
Beams, New York	2.74	2.74	2.74	2.34
Steel hoops, Pittsburgh	3.00	3.00	3.15	2.75

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire, *Per Lb. to Large Buyers:*	Dec. 11, 1923 Cents	Dec. 4, 1923 Cents	Nov. 13, 1923 Cents	Dec. 12, 1922 Cents
Sheets, black, No. 28, P'gh.	3.75	3.75	3.75	3.35
Sheets, galv., No. 28, P'gh.	**4.00**	4.85	5.00	4.35
Sheets, blue an'l'd, 9 & 10.	3.00	3.00	3.00	2.50
Wire nails, Pittsburgh	3.00	3.00	3.00	2.70
Plain wire, Pittsburgh	2.75	2.75	2.75	2.45
Barbed wire, galv., P'gh.	3.80	3.80	3.80	3.35
Tin plate, 100-lb. box, P'gh.	$5.50	$5.50	$5.50	$4.75

Old Material, Per Gross Ton:				
Carwheels, Chicago	**$19.50**	$19.00	$17.50	$24.00
Carwheels, Philadelphia	19.50	19.50	17.50	20.00
Heavy steel scrap, P'gh.	18.50	18.50	16.00	20.00
Heavy steel scrap, Phila.	**16.50**	16.00	15.00	16.00
Heavy steel scrap, Ch'go.	**16.00**	15.00	14.00	17.00
No. 1 cast, Pittsburgh	19.50	19.50	18.50	22.50
No. 1 cast, Philadelphia	20.00	20.00	19.00	20.00
No. 1 cast, Ch'go (net ton)	19.50	19.50	18.00	19.50
No. 1 RR. wrot. Phila.	**18.50**	18.00	17.00	19.00
No. 1 RR. wrot. Ch'go (net)	**15.00**	13.50	12.50	15.00

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$4.00	$4.00	$3.75	$6.50
Foundry coke, prompt	*4.75*	5.00	4.75	7.50

Metals, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Lake copper, New York	13.25	13.25	13.50	14.12½
Electrolytic copper, Straits	12.87½	12.87½	13.25	13.75
Zinc, St. Louis	*6.35*	6.35	6.45	7.22½
Zinc, New York	*6.60*	6.70	6.80	7.57½
Lead, St. Louis	**7.37½**	7.00	6.55	6.95
Lead, New York	**7.62½**	7.10	6.85	7.27½
Tin (Straits), New York	*46.50*	47.25	44.37½	37.25
Antimony (Asiatic), N. Y.	*8.65*	8.75	9.25	6.35

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Composite Price, Dec. 11, 1923, Finished Steel, 2.775c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets

These products constitute 88 per cent of the United States output of finished steel

Dec. 4, 1923,	2.775c.
Nov. 13, 1923,	2.775c.
Dec. 12, 1922,	2.439c.
10-year pre-war average,	1.689c.

Composite Price, Dec. 11, 1923, Pig Iron, $21.88 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham

Dec. 4, 1923,	$21.88
Nov. 13, 1923,	20.94
Dec. 12, 1922,	25.71
10-year pre-war average,	15.72

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right along has been an accepted fact. In explanation for the market's strength, there is, of course, a belief that stocks in consumers' and jobbers' hands are very moderate and this is taken to indicate freer buying after the turn of the new year if for no other reason than the restoration of ordinary reserve supplies. With the scrap market showing a stronger tendency, one avenue of low steel costs is blocked, and another reason for the stand of the manufacturers is that they doubt that such a price cut as might be made would prove any stimulus to buying. Railroad buying is confidently expected and it is figured that the automobile makers cannot much longer delay purchases if they expect to meet the spring demand easily and promptly. It is also believed that the oil industry has turned the corner and will be a factor in the steel market before the new year is far advanced. The recent marking up of steel scrap has been sustained by further Steel Corporation purchases, as well as by a few of the independent companies.

Pig iron trading has become extremely quiet, but there no longer seems to be much pressure to sell and prices are steady. The coke market still reflects an absence of resumptions among furnaces now idle, and some hesitancy by the owners of furnaces in production about buying ahead.

Steel Corporation plants in this and nearby districts continue to operate at a high rate, but this is partly explained in the case of the Carnegie Steel Co., which is running about 90 per cent of ingot capacity, by the fact that it is producing sheet bars on a heavy scale for its associated company, the American Sheet & Tin Plate Co. The latter, being very well supplied with orders and specifications in tin plate for early 1924

delivery, is running practically full at its tin plate mills, and has sufficient business to keep about 85 per cent of its sheet mills going. Independent steel works operations range from 50 to 65 per cent, with a general average around 60 per cent.

Pig Iron.—Trading reflects the well covered condition of melters and an absence of selling pressure among producers. The Sharon Steel Hoop Co. recently closed for 4000 tons of basic iron from another Youngstown steel company at $21, furnace. The Follansbee Bros. Co. is in the market for 5000 to 6000 tons of this grade for first quarter shipments. This business probably will be placed with a nearby producer having a decided freight advantage over Valley furnaces. Only small lot tonnages of foundry grade lately have been placed, but in all cases the business was at $22, furnace, for the base grade. Bessemer iron is stronger, not because of a large demand but because of a withdrawal of recent low prices. This grade now is held at $23 by all producers and sales by Valley furnaces have been at $23. Some malleable iron still is available at $20, but the more common quotation is $22 and some makers are asking $22.50. No sales of this grade recently have been noted. Low phosphorus iron also is inactive, with the Valley makers quoting $29 to $30.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being $1.76 per gross ton:

Basic	$21.00
Bessemer	23.00
Gray forge	$21.50 to 22.00
No. 2 foundry	22.00 to 22.50
No. 3 foundry	21.50 to 22.00
Malleable	20.00 to 22.50
Low phosphorus, copper free	29.00 to 30.00

Ferroalloys.—The interesting development of the week is the announcement of 1924 prices for ferrosilicon of the higher silicon contents. For 50 per cent material the price is $75, delivered East of the Mississippi River, and $130 for 75 per cent grade. These prices are $7.50 and $10 per ton, respectively, below the 1923 contract prices. On 50 per cent material, buyers are said to have responded fairly well. That grade this year is being offered as 49 to 51 per cent, with $1 a ton up or down, according to the percentage of silicon above or below 50 per cent. Ferromanganese is firmly held by agents of British producers at $110, c.i.f. Atlantic seaboard, duty paid, but with domestic producers quoting $1 a ton less and having sold much tonnage at $107.50, there is very little activity in British material. A Pittsburgh district steel maker using only the British product recently was able to pick up about 400 tons of resale material at $107. It is said that a large brokerage interest is quoting $107.50, seaboard, with the option of shipping either domestic or British alloy. Short selling is suspected in this case. Small sales in this district are claimed by American makers at $109. Prices are given on page 1623.

Semi-Finished Steel.—So far the Carnegie Steel Co. is the only maker of sheet bars that has named first quarter prices, its price being $42.50, but independent makers are holding at that price and are expected to name that figure on first quarter contracts. Current activities in all forms of semi-finished steel are limited, because orders for finished material for delivery over the remainder of the year are light, and orders for shipment after Jan. 1 are not yet of a size to encourage usual buying of billets, slabs and sheet bars. Although some mills are talking $42.50 for all of these forms, billets and slabs still can be bought at $40. Forging billets are priced at $45, but that price is not readily obtained and is being shaded on attractive inquiries. There is some first quarter contracting for rods at the present base, but specifications are not large except for January shipments. Skelp prices are indeterminate because there is so little demand. Prices are given on page 1623.

Wire Products.—Manufacturing consumers are showing much more interest in the market and a good many contracts for first quarter tonnages have been received by local mills from that direction. Jobbers, however, continue to defer purchases until the completion of inventory taking. Jobbers' stocks of nails are said to be fairly large, but not very well balanced as to sizes. There are no suggestions of price cutting, except in some of the specialties, in which the extras are large enough to permit a profit at lower prices. Prices are given on page 1622.

Iron and Steel Bars.—Demand for steel bars is very limited and large consumers, such as the makers of cold-finished steel bars and shafting and of bolts, nuts and rivets, are not yet showing real interest in first quarter requirements. This condition, however, is creating no anxiety among makers and there is no shading of the regular price. Iron bar prices also are holding at recent levels despite light demand.

We quote soft steel bars, rolled from billets, at 2.40c. base; bars for cold-finishing of screw stock analysis, $3 per ton over base; reinforcing bars, rolled from billets, 2.40c. base; refined iron bars, 3.25c. base, in carload lots or more, f.o.b. Pittsburgh.

Steel Rails.—Light billet rails still are quoted at 2.25c., base, but the sales still are very limited, not only because actual requirements of consumers are small, but because prices of rerolled rails are so much more attractive.

We quote light rails rolled from billets at 2.25c. base (25-lb. to 45-lb.); rerolled rails, 1.85c. to 2c. base (12-lb. to 45-lb.), f.o.b. mill; standard rails, $43 per gross ton mill, for Bessemer and open-hearth sections.

Tubular Goods.—Demand for standard pipe holds up well, and shipments are little, if any, in excess of incoming business. This is not the case with oil well pipe and line pipe, demand for which still reflects the uncertainty in the oil industry. That industry seems to have turned the corner as to overproduction, but until the surplus is reduced, drilling campaigns probably will be mapped out in conservative fashion. The trade looks for improvement in the oil situation before the new year is very far along, and as stocks of pipe in the oil districts are light, the mills will feel the betterment in the shape of orders more promptly than would be the case if oil field jobbers were heavily stocked. Boiler tubes are still dull and price concessions are more frequent, if anything, than they have been. Discounts are given on page 1622.

Sheets.—Business often before has been better than it is just now, but important producers are encouraged by frequent orders from those who have been holding back in expectation of lower prices and also by increased evidence of interest in future supplies on the part of the automotive industry, manifest in visits of representatives of important consuming interests for information. The question of prices, particularly on automobile sheets, is not entirely settled with buyers, but it is a fact that recent low prices are disappearing. Few, if any, of the independent mills, now will take black sheets below 3.75c., base, or galvanized sheets below 4.90c., base. One large company was able to buy automobile sheets at 5.10c., base, but this was for run of mill material; the companies making full finished auto body stock to specifications are not going below 5.35c., base, (22 gage). Sheet mill operations are holding at the recent average of about 75 per cent, the American Sheet & Tin Plate Co. running about 80 per cent and the independents about 70 per cent. Prices are given on page 1622.

Tin Plate.—Steel Corporation tin plate customers are specifying freely against early 1924 tonnages, and lately orders and specifications have been coming to independent mills in good fashion. The American Sheet & Tin Plate Co. has about 95 per cent of its tin mills in operation, and the independents are doing almost as well; industry as a whole is averaging close to 90 per cent. The price is unquestioned at $5.50 per base box, Pittsburgh, for standard cokes.

Cold-Finished Steel Bars.—Announcement of the LaSalle Steel Co., Chicago, of a price of 3c., base, Chicago, is disturbing to local producers quoting that price f.o.b., Pittsburgh, since the Chicago mill has a decided freight advantage into some heavy consuming territory. Mills here which want to compete in Chicago would have to absorb $6.80 a ton in freight, while in Indiana points the freight advantage is about $3 a ton. The difference in the freight rate to Detroit is a matter of 1½c. per 100 lb. in favor of Chicago, or 30c. a ton. Mills here still are quoting 3c., base, Pittsburgh, but the market is unsettled by the stand of the

Chicago company. Ground shafting is quoted at 3.40c., base, f.o.b. mills in carload lots or more.

Hot-Rolled Flats.—Competition for business still is sufficiently sharp to keep prices in buyers' favor. This is particularly true in strips, which have sold as low as 2.60c., base, and still can be bought from some mills at 2.75c. Several makers, including the Steel Corporation, still are quoting 3c., base, on hoops, bands and strips, but little tonnage of the latter can be secured at that figure, and there are some demands for revisions of contracts made at 3c.

Cold-Rolled Strips.—The market now is quotable down to 4.75c., base, and even that price has been shaded on particularly attractive business. At the same time, there are some makers who are still holding to 5c. and claim to be making sales at that figure.

Structural Material.—Some mills report an increase in both orders and specifications, but it would be exaggeration to call the market even fairly active. Efforts to shade prices, however, are not successful. Prices are given on page 1622.

Bolts, Nuts and Rivets.—More makers of bolts and nuts have withdrawn the extra discounts recently made to secure orders and while the market is not particularly active, it is much firmer than it has been before for some time. Sales of rivets are reported at the recently established base of $2.90 per 100 lb. Prices and discounts are given on page 1622.

Plates.—Activity still is lacking, but mills here are holding very firmly to the 2.50c., base, Pittsburgh. Prices are given on page 1622.

Track Supplies.—New business is small but considerable tonnage has been figured on, which is expected to be placed within the next few weeks. Small spikes, finding heaviest use in coal mines, are slow of sale because of the slow and unsatisfactory coal situation. Prices are given on page 1622.

Coke and Coal.—The beehive oven coke market is hesitant and not particularly firm. Few, if any, blast furnaces now on the idle list will be lighted during the first quarter of 1924, unless there is a very substantial rise in prices, and that seems unlikely in view of the fact that so many consumers of iron are well covered into the new year and supplies of iron available for the market still are so large. Fuel requirements of active stacks running on beehive oven coke do not amount to much in this and nearby districts and there is talk that some of these furnaces soon will suspend. Such first quarter contract business as has been closed has been at $4.25 to $4.40 per net ton at ovens. The prevailing price on spot tonnages still is $4. Foundry coke ranges from $4.75 to $5.50 for spot, and from $5.50 to $6.50 on first half contract. The coal market still shows considerable strength in slack grade, which has recently sold as high as $1.65 for steam and $1.75 for gas, this for Pittsburgh coal. Slack grade in the Fairmont district ranges from $1.40 to $1.50. Mine run steam coal ranges from $1.90 to $2.40 for Pittsburgh coal and from $1.40 to $1.75, Connellsville coal. Gas coal holds at $2.25 for mine run, but coking grade is weak at $1.75 to $2.15.

Old Material.—The recent advance in heavy melting steel scrap has been sustained by further Steel Corporation purchases. The Carnegie Steel Co. has practically duplicated its first purchase as to quantity and price for Munhall, while there has been a purchase of 5000 tons by the National Tube Co. at $18.50 for delivery at Lorain, Ohio. While a Canton, Ohio, consumer has paid $19 for this grade and a local mill went to $19.50 for 5000 tons, independent steel companies generally remain out of the market and show no inclination to follow the prices made by these transactions. The effect of the Steel Corporation purchases is really more pronounced in outside markets than it is here. It is sensed in Youngstown that the National Tube Co. purchase for Lorain will check the flow of material to that center, and while the mills there remain passive, dealers are bidding $18.50 to $18.75 for supplies in an effort to cover short sales. Railroad material also is bringing high prices for the same reason, the melting steel in the Pennsylvania Railroad December list bringing $19.50 per gross ton. The scrap trade as a whole is much confused as to what the Steel Corporation purchases presage. It is pointed out that when the Carnegie Steel Co. was operating at a much higher rate than at present it was not a purchaser of scrap; prices were high in the spring and at that time this company put on idle blast furnaces and made pig iron, but it would not pay to do so today, unless there was an assurance of a continued run on the furnace, since scrap is at about the same price as the cost of making the pig iron. It is commented upon that other steel works' grades are not being strengthened much by the rise in heavy melting steel. Compressed sheets, for example, which ordinarily are within $2 a ton of heavy melting grades, have not sold above $16.50, efforts to secure more having failed, while the sale of that price involved material that ordinarily fetches the top of the market. Railroad specialties also have failed to advance. Blast furnace material is very scarce and very firm.

We quote for delivery to consumers' mill in the Pittsburgh and other districts taking the Pittsburgh freight rate as follows:

	Per Gross Ton
Heavy melting steel	$18.50 to $19.00
No. 1 cast, cupola size	19.50 to 20.00
Rails for rolling, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	18.50 to 19.00
Compressed sheet steel	15.50 to 16.50
Bundled sheets, sides and ends	14.50 to 15.00
Railroad knuckles and couplers	20.00 to 20.50
Railroad coil and leaf springs	20.00 to 20.50
Low phosphorus blooms and billet ends	21.50 to 22.00
Low phosphorus plate and other material	20.00 to 20.50
Railroad malleable	17.50 to 18.00
Steel car axles	19.00 to 19.50
Cast iron wheels	18.50 to 19.00
Rolled steel wheels	20.00 to 20.50
Machine shop turnings	13.50 to 14.00
Sheet bar crops	19.00 to 19.50
Heavy steel axle turnings	16.00 to 16.50
Short shoveling turnings	14.50 to 15.00
Heavy breakable cast	17.00 to 17.50
Stove plate	14.00 to 14.50
Cast iron borings	14.50 to 15.00
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	18.50 to 19.00

Heavy Production of Iron and Steel in Alabama

BIRMINGHAM, Dec. 10.—The production figures for November show that Alabama produced 2000 more tons than in October, though the totals of the country showed a decrease. Effort is being made in various directions in this district to get record production and splendid reports are being made, the iron output being obtained with 21 blast furnaces in November against 22 in October. The Tennessee Coal, Iron & Railroad Co. reported six records broken in November, as follows: Ishkooda No. 14 ore mines, 11,861 tons against 11,732 tons in August, 1923; total of all Ishkooda ore mines, 70,731 tons against 67,431 tons in October, 1923; Blocton No. 10 coal mine, 15,884 tons against 15,327 in May, 1923; Bessemer No. 4 blast furnace 9,052 tons, against 8,858 in October, 1915; Ensley steel rail mill, 50,658 tons against 49,325 in March, 1923; Fairfield tie plate mill, 6,760 tons against 6,675 in October, 1923. The compilation of production figures as to pig iron show a larger amount of iron manufactured in the 11 months of the year than during all 12 months for 1922 and the total for this year promises to be second to the record output for the State, which was accomplished in 1917 when 2,953,705 tons was reported, about 2,787,000 tons being estimated for this year.

Production of pig iron in Alabama is not to be interrupted in the least during this month. The Woodward Iron Co. is blowing out one of the furnaces at Woodward for repairs but one of the Vanderbilt furnaces is having the torch applied now so that the make of that company is not disturbed. The Alabama Co. has already started the work of repairing the blast furnace at Gadsden, recently blown out for repiars.

The annual Christmas dinner and entertainment of the Pittsburgh Foundrymen's Association will be held at the General Forbes Hotel, Monday evening, Dec. 17.

Chicago

Santa Fe Expected to Place Large Rail Order Soon—Wabash Buys Cars

CHICAGO, Dec. 11.—Prospective railroad buying is the feature of the finished steel market. The Santa Fe is expected to place orders shortly for 100,000 tons of rails and 25,000 tons of track supplies, and the New York Central will probably close against its inquiry for 40,000 tons of fastenings before the end of the current week. The Wabash has purchased 2000 freight cars, requiring 20,000 tons of steel, which is expected to be placed with local mills.

Outside of this activity in rails and cars, there have been no developments in the market worthy of particular note. Inquiries from miscellaneous consumers of steel are more numerous, but new bookings of the mills still fall short of shipments. Restricted buying will probably continue to be the rule until inventory taking has been completed.

Finished steel prices remain unchanged except for a reduction of $3 a ton in track spikes and bolts. Steel works and blast furnace operations are substantially the same as last week.

As a result of the abandonment of the Pittsburgh base by a Chicago district cold-rolled steel mill, local warehouses have reduced cold-finished steel bars and shafting $6 a ton to 4c. per lb. for rounds and 4.50c. for flats, squares and hexagons.

Pig Iron.—The week has been lacking in both sales and inquiries. The only large transaction reported was the purchase of 2500 tons of Northern foundry for first half by a Milwaukee melter. The one important new inquiry comes from a Chicago user and calls for 3000 tons of foundry for first quarter. Southern iron appears to be steady at $21 base, Birmingham, although it is possible that if an attractive tonnage were submitted to the furnaces, a better price could be obtained. Recent sales of Southern in this territory have been few and small, the largest reported being a 300-ton lot. A Milwaukee melter has closed for 200 tons of 7 per cent silvery at $1 a ton under the new schedule, but two 150-ton sales in Michigan were at the full prices. A Chicago melter has purchased 100 tons of low phosphorus at $34, delivered. A considerable portion of the tonnage, however, was copper bearing material which ordinarily sells for less than copper free iron. The latter appears to be steady at $30, Valley furnace, or $34.79, delivered Chicago.

Quotations on Northern foundry high phosphorus malleable and basic irons are f.o.b. local furnace and do not include an average switching charge of 61c. per ton. Other prices are for iron delivered at consumer's yard or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal averaging sil. 1.50, delivered at Chicago..	$29.15
Northern coke, No. 1 sil. 2.25 to 2.75	$23.50 to 24.00
Northern coke, foundry, No. 2, sil. 1.75 to 2.25	23.00 to 23.50
Malleable, not over 2.25 sil.	23.00 to 23.50
Basic	23.00 to 23.50
High phosphorus	23.00 to 23.50
Southern No. 2	27.01
Low phos., sil. 1 to 2 per cent, copper free	34.79
Silvery, sil. 8 per cent	37.29

Ferroalloys.—Most users of 50 per cent ferrosilicon have contracted for their 1924 needs at $75, delivered. Some business in 75 per cent ferrosilicon has been closed at $140, delivered. A few carloads of spiegeleisen have been sold at $39, furnace, or $47.58, Chicago. No sales of ferromanganese are reported, but the lowest going quotation is said to be $110 f.o.b. New Orleans.

We quote 80 per cent ferromanganese, $117.56, delivered; 50 per cent ferrosilicon, $75, delivered; spiegeleisen, 18 to 22 per cent, $47.58, delivered.

Plates.—Demand has improved, although actual mill bookings are still light. The Wabash has ordered 2000 freight cars, requiring about 20,000 tons of steel, which will probably be furnished by local mills. Inquiries from boilermakers and other miscellaneous users of plates are more numerous. Prices remain unchanged at 2.60c. Chicago.

The mill quotation is 2.60c., Chicago. Jobbers quote 3.30c. for plates out of stock.

Sheets.—The market is steadily growing firmer as those mills which have been selling at concessions accumulate heavier bookings. While there is still no quotable change in the range of prices on black sheets, few producers are willing to sell galvanized at less than the Steel Corporation price. Japanese commitments bulk larger than had been anticipated and domestic orders are coming in more freely.

Mill quotations are 3.75c. to 3.85c. for No. 28 black, 3c. for No. 10 blue annealed and 4.90c. to 5c for No. 28 galvanized, all being Pittsburgh prices, subject to a freight rate to Chicago of 34c. per 100 lb.

Jobbers quote, f.o.b. Chicago, 4c. for blue annealed, 4.70c. for black and 5.85c. for galvanized.

Cast Iron Pipe.—St. Paul has placed 1750 tons of 6-, 8- and 12-in. water pipe with the National Cast Iron Pipe Co., 950 tons of 16-in. with the Glamorgan Cast Iron Pipe Co., and 350 tons of 20-in. with the American Cast Iron Pipe Co. Minneapolis has awarded 1500 tons to the American Cast Iron Pipe Co. Dayton, Ohio, takes bids today on 1200 tons of 4- to 20-in. and 75 tons of fittings. Demand from private companies is heavy. The Public Service Co. of Northern Illinois is expected to close on 2800 tons this week. The Grand Rapids Gas Co. is in the market for 1400 tons of 4- to 16-in. gas pipe, and the Detroit City Gas Co. is inquiring for 12,000 tons of 4- to 24-in. gas pipe. Prices are fairly steady.

We quote per net ton, f.o.b. Chicago, as follows: Water pipe, 4-in., $59.20; 6-in. and above, $55.20; class A and gas pipe, $5 extra.

Structural Material.—While building prospects are still regarded as good, fabricating awards and inquiries reported during the week were strikingly few. Prominent among new projects on which bids have been asked is a dock at Claiborne Avenue landing, New Orleans, requiring 1700 tons. That the general construction outlook is still favorable is indicated by the fact that permits issued in Chicago in November were practically equal in terms of frontage and investment with those granted in October, and were nearly one-third larger than those for November, 1922. Plain material prices remain steady at 2.60c. Chicago.

The mill quotation on plain material is 2.60c., Chicago. Jobbers quote 3.30c. for plain material out of warehouse.

Rails and Track Supplies.—The Santa Fe, which entered the market for 100,000 tons of rails and 25,000 tons of track supplies last week, is expected to place orders this week. Miscellaneous rail orders taken by local producers in the last seven days total 10,000 tons. Early action is looked for on the large inquiry of the New York Central for fastenings, which developed lower prices than had previously been quoted. Standard spikes are available at 3.10c. mill, and track bolts at 4.10c. mill.

Standard Bessemer and open-hearth rails, $43; light rails, rolled steel, 2.25c., f.o.b. makers' mills.

Standard railroad spikes, 3.10c. mill; track bolts with square nuts, 4.10c. mill; iron tie plates, 2.55c. to 2.60c. mill; steel tie plates, 2.60c., f.o.b. mill; angle bars, 2.75c., f.o.b. mill.

Jobbers quote standard spikes out of warehouse at 3.75c. base and track bolts, 4.75c. base.

Bolts and Nuts.—Notwithstanding the firmer stand of bolt makers on prices, specifications are heavier, and a fair number of first quarter contracts have been closed. For one important bolt manufacturer specifications thus far this month have equaled capacity production. Ruling discounts are those on page 1622, except that they are on f.o.b. Chicago basis.

Jobbers quote structural rivets, 3.75c.; boiler rivets, 3.95c.; machine bolts up to ⅞ x 4 in., 55 and 5 per cent off; larger sizes, 55 and 5 off; carriage bolts up to ⅞ x 6 in., 50 and 5 off; larger sizes, 50 and 5 off; hot pressed nuts, squares and hexagons, tapped, $3.50 off; blank nuts, $3.50 off; coach or lag screws, gimlet points, square heads, 60 and 5 per cent off.

Bars.—Consumers and distributors of merchant and reinforcing bars are sounding out the market for their forward needs, but are slow in placing orders. Some of the automotive interests, notably the Ford company, are increasing their production schedules and are taking a proportionately heavier tonnage of steel. The Ford

organization, now manufacturing close to 7500 cars a day, plans to raise its daily output to 10,000 cars. Soft steel bars are unchanged at 2.50c. Chicago. Demand for bar iron, while still unsatisfactory, shows some measure of improvement. One mill has accumulated enough tonnage to insure single turn operations throughout the remainder of the month. Hard steel bar mills, also on a single turn basis, have bookings of from two to four weeks ahead.

Mill prices are: Mild steel bars, 2.50c., Chicago; common bar iron, 2.40c., Chicago; rail steel, 2.30c., Chicago mill.

Jobbers quote 3.20c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 4c. for rounds and 4.50c. for flats, squares and hexagons.

Jobbers quote hard and medium deformed steel bars at 3c. base; hoops, 4.45c.; bands, 3.95c.

Wire Products.—Forward contracting fails to develop in any volume, but as inventory taking will soon be completed jobbers and manufacturing consumers are expected to pay more attention to their first quarter needs. Meanwhile most orders are small, calling for prompt deliveries, and mills continue to build up their stocks. Mill prices, which are unchanged, are shown on page 1622.

We quote warehouse prices f.o.b. Chicago: No. 6 to No. 9 bright basic wire, $3.90 per 100 lb.; extra for black annealed wire, 15c. per 100 lb.; common wire nails, $3.80 per 100 lb.; cement coated nails, $3.25 per keg.

Old Material.—A leading local mill has placed 10,000 tons of heavy melting at $16 per gross ton delivered. This price now appears to be the bottom of the market, as dealers are paying $16.50 to fill old orders. An iron mill has closed for a fair tonnage of No. 1 busheling and No. 1 wrought at $12 and $15 per net ton respectively. A round tonnage of malleable has been purchased by a consumer at $20.50 per gross ton delivered and gray iron foundries have bought cast grades more freely. While consumer buying has revived, it is notable that a number of important users who have bought have no immediate need for additional supplies, but are apparently placing orders to take advantage of low current prices. If scrap continues to advance, there will be less incentive to buy ahead, particularly in view of the fact that the present rate of consumption does not seem to warrant a sustained rise in prices. Railroad lists include: Santa Fe, 3000 tons; Northern Pacific, 2000 tons; Great Northern, 2500 tons; Southern, 15,000 tons; Chicago & Eastern Illinois, 1700 tons; Chicago Great Western, Chicago & Alton and Baltimore & Ohio, Chicago Terminal, 500 tons each.

We quote delivery in consumers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Iron rails	$19.50 to $20.00
Cast iron car wheels	19.50 to 20.00
Relaying rails, 56 and 60 lb.	26.00 to 27.00
Relaying rails, 65 lb. and heavier	32.00 to 35.00
Forged steel car wheels	19.00 to 19.50
Railroad tires, charging box size	19.00 to 19.50
Railroad leaf springs, cut apart	19.50 to 20.00
Rails for rerolling	16.50 to 17.00
Steel rails, less than 3 ft.	18.50 to 19.00
Heavy melting steel	15.50 to 16.50
Frogs, switches and guards cut apart	15.50 to 16.50
Shoveling steel	15.75 to 16.25
Drop forge flashings	11.50 to 12.00
Hydraulic compressed sheets	12.50 to 13.00
Axle turnings	12.50 to 13.00
Steel angle bars	17.50 to 18.00

Per Net Ton

Iron angle and splice bars	20.00 to 20.50
Iron arch bars and transoms	20.00 to 20.50
Iron car axles	26.00 to 26.50
Steel car axles	17.00 to 17.50
No. 1 busheling	12.00 to 12.50
No. 2 busheling	7.50 to 8.00
Cut forge	14.50 to 15.00
Pipes and flues	9.50 to 10.00
No. 1 railroad wrought	15.00 to 15.50
No. 2 railroad wrought	14.50 to 15.00
Steel knuckles and couplers	17.50 to 18.00
Coil springs	19.00 to 19.50
No. 1 machinery cast	19.50 to 20.00
No. 1 railroad cast	18.50 to 19.00
No. 1 agricultural cast	18.50 to 19.00
Low phos. punchings	15.50 to 16.00
Locomotive tires, smooth	16.50 to 17.00
Machine shop turnings	8.00 to 8.50
Cast borings	10.75 to 11.25
Short shoveling turnings	10.75 to 11.25
Stove plates	17.00 to 17.50
Grate bars	16.50 to 17.00
Brake shoes	17.50 to 18.00
Railroad malleable	18.00 to 18.50
Agricultural malleable	18.00 to 18.50

Warehouse Prices.—Local jobbers have reduced standard track spikes and bolts $3 a ton in conformity with the decline in mill prices. The new quotations will be found under the paragraph on rails and track supplies. Structural and boiler rivets have been reduced $5 a ton, the new prices being shown under the paragraph on bolts and nuts. Forging billets have been reduced $8 a ton, the new price on 0.50 to 0.25 carbon billets being $3 per 100-lb. and on 0.35 to 0.40 carbon, $3.05 per 100-lb.

Reinforcing Bars.—Buying has contracted appreciably, although a number of attractive projects have been added to the extensive list of pending jobs. The decline in business is attributable, in part, to the approach of the holidays and also, no doubt, to a belief among consumers that mill prices will decline. Local bar dealers in various parts of the West, who are in the habit of contracting for first quarter needs at this time, are delaying their purchases.

Lettings include:

Anders apartment buildings, Chicago, 200 tons to Barton Spiderweb System Co.

Blue Valley Creamery Co. plant, Chicago, 230 tons to Barton Spiderweb System Co.

Pending business includes:

Beaumont High School building, St. Louis, Mo., 550 tons.

Junior High School, South Bend, Ind., 200 tons, bids on general contract taken.

Foundations for Ford Motor Co. plant, St. Paul, Minn., 175 tons, new bids being taken.

Wayne Medical Building, Fort Wayne, Ind., 175 tons, revised figures being taken.

High school, Sedalia, Mo., 150 tons.

Federal Reserve Bank building, Little Rock, Ark., 125 tons.

Sheet Market at Youngstown Shows Some Improvement

YOUNGSTOWN, Dec. 11.—Though sheet mill schedules in the Mahoning Valley are still substantially below normal, representing at present from 60 to 65 per cent of capacity, conditions in this branch of the industry are appreciably better than they were a month ago. In fact, inquiry has broadened perceptibly, and it is expected that during the first quarter of 1924 there will be a marked improvement in demand, especially for the high grade sheets.

Consumers who have been in the market to any extent are well covered over the remainder of this year, and interest, of course, therefore centers on what the new year will bring forth.

Some of the larger independents claim to observe less price cutting on the part of smaller makers than has heretofore existed. Doubtless, however, the non-integrated rollers, many of whom have been accepting tonnage at little or no profit in order to keep their mills active, will still be willing to cut under the market for some time, in order to prevent their plants from becoming idle.

More interest in the full-finished sheet market is being evidenced by the automobile industry and by builders of automobile bodies.

Youngstown Scrap Market

YOUNGSTOWN, Dec. 11.—In spite of the fact that there is little buying of scrap by melting interests, prices are sentimentally stronger, at least, than a week ago. The market has been given strength by the purchases by the Carnegie Steel Co., of heavy melting steel at $19. Whereas $18 represented the market peak last week on this grade, dealers say it has moved up in the meantime to $18.50, but regard the range as from $18 to $18.50. This is, however, fully $1 up from recent levels.

In this district, the market on compressed sheet steel is from $15.50 to $16; machine shop turnings, $12.50 to $13, and cast iron borings, $13.50 to $14.

Dealers are engaged in buying against anticipated first quarter, 1924, requirements, but admit they are somewhat hazy as to the extent of these needs.

New York

Structural Awards Heavy—Pig Iron Dull—Old Material Stronger

NEW YORK, Dec. 11.—The pig iron market has become extremely dull, with both sales and inquiries few in number and for limited tonnages. The A. P. Smith Co. bought 600 tons of No. 2 and No. 2X for delivery at Bloomfield, N. J., and the New York Central, which was in the market for 600 tons of foundry iron and 600 tons of charcoal, is understood to have placed at least a part of the tonnage. An interesting feature of the purchase of the A. P. Smith Co. was that it inquired for second quarter delivery, but found prices for that delivery higher than for first quarter and placed its order for the latter. Furnaces are slow to quote for delivery after April 1, and when they do so, name a price considerably higher than for first quarter. Prices are untested, but range from $21.50 to $22, Buffalo, and $22.50 to $23, eastern Pennsylvania. In the latter district $23 is the prevailing price, but it has been shaded on desirable business. The tendency toward greater strength on the part of the coke market is one influence tending to restrain furnaces from selling for delivery after April 1.

We quote delivered in the New York district as follows, having added to furnace price $2.27 freight from eastern Pennsylvania, $4.91 from Buffalo and $5.44 from Virginia:

East. Pa. No. 1X fdy., sil. 2.75 to 3.25	$25.27 to $25.77
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	24.77 to 25.27
East. Pa. No. 2, sil. 1.75 to 2.25	24.77 to 25.27
Buffalo, sil. 1.75 to 2.25	26.41 to 26.91
No. 2X Virginia, sil. 2.25 to 2.75	29.94 to 30.44
No. 2 Virginia, sil. 1.75 to 2.25	29.44 to 29.94

Ferroalloys.—A moderately good business in ferromanganese for delivery next year is evidently being consummated, but just how much is difficult to gage. Domestic producers are apparently taking most of the business at a concession under the British price of $110, seaboard. A fair amount of inquiry continues before the market. Some business has been done in spiegeleisen and there are inquiries still under negotiation amounting to several hundred tons. Prices are unchanged. Contracts for 1924 are being negotiated for 50 per cent ferrosilicon and some have been closed on a basis of $75 per ton, delivered, where the content is 50 per cent ferrosilicon, the arrangement being that $1 for each percentage above or below 50 per cent will be added or subtracted. In some cases $1.50 for each per cent is the differential. Contracts are also being made for consumers' needs of ferrochromium next year, but the price is not yet announced.

Cast-Iron Pipe.—The market is quiet except for prompt shipment tonnages, which bring the established schedule of prices. Concessions still rule on tonnages which consumers are willing to accept through the winter months. The Consolidated Gas Co., New York, is reported to have closed on several thousand tons of pipe for next year's requirements. We quote per net ton, f.o.b. New York, in carload lots, as follows: 6-in. and larger, $61.60 to $63.60; 4-in. and 5-in., $66.60 to $68.60; 3-in., $76.60 to $78.60, with $5 additional for Class A and gas pipe. Demand for soil pipe is light, the usual dullness at this season having set in. A resumption of activity is expected early next year, as stocks of jobbers here in the East are no more than normal in most instances and with some are rather low. Discounts cover a fairly wide range. We quote discounts of both Southern and Northern makers, f.o.b. New York, in carload lots, as follows: 6-in., 29½ to 35¾ per cent off list; heavy, 39½ to 45¾ per cent off list.

Warehouse Business.—Light demand is generally reported, the only products particularly active being materials such as structural steel, pipe, etc., that enter into building construction that still continues as a result of the open weather. Black and galvanized sheets are stronger and it is doubtful that less than 4.60c. per lb. base on black and 5.60c. per lb. base on galvanized could now be done. Blue annealed sheets are also firmer, the recent decrease of 25c. per 100 lb. having exercised a stabilizing effect on the market. While there are still isolated instances of sales at less than the 4.34c. per lb. base, sellers quoting below this base can offer only a few gages. As a whole, the market is quiet and no increase in activity is expected until after the first of the year. We quote prices on page 1638.

Finished Iron and Steel.—Letting of contracts for winter construction goes on at a rapid rate. Awards of structural steel in the East, reported to THE IRON AGE for the past week, total close to 20,000 tons and altogether 25,000 or 30,000 tons of work is still pending, most of this having been reported by specific jobs in recent issues. One of the large new jobs, on which bids are now being taken, is a building for the Bank of America, New York, which will require 4000 tons. A local fabricator was awarded the contract for fabrication of 8500 tons of steel for an office building at Broadway and Fortieth Street, New York. Activity in structural steel is the only outstanding factor in the local steel market. Other products are very quiet and the general attitude of manufacturing consumers is to wait until after the turn of the year. In plates, shapes and bars practically no first quarter contracts are being placed. While no greater price weakness in these products is noted, some other products are being sold at concessions. One company has offered wire nails to a considerable number of jobbers at 2.90c. per lb., Pittsburgh, but other makers continue to quote 3c. There is very little railroad inquiry or buying. The Southern Railway is inquiring for 10,000 to 15,000 tons of tie plates.

We quote for mill shipments, New York delivery, as follows: Soft steel bars, 2.74c.; plates and structural shapes, 2.74c. to 2.84c.; bar iron, 2.74c.

Coke.—A stable ratio between production and consumption has evidently been maintained and prices continue unchanged. Standard foundry coke is firm at $5.25 to $6.25 per ton and standard furnace at $4 to $4.50 per ton. By-product is quoted at $10.91, Newark and Jersey City, N. J.

Old Material.—While the market is distinctly stronger, part of this strength is the result of buying by dealers and brokers in anticipation of further advances in prices. As high as $17 per ton, eastern Pennsylvania is reported being paid by brokers, but in general the quotation on heavy melting steel being shipped by sellers with mill contracts is $16.50 for railroad grade. Machine shop turnings are strong at $13.50 to $14 per ton, delivered eastern Pennsylvania, and a heavy demand for borings and turnings is reported, $11 to $11.50 per ton, delivered eastern Pennsylvania, generally being paid. Forge fire is also stronger, bringing $13.50 to $14, delivered. Specification pipe is going forward to one eastern Pennsylvania consumer at $15.50 per ton, and stove plate is unchanged at $16 to a Harrisburg consumer and to foundries in New Jersey.

Buying prices per gross ton New York follow:

Heavy melting steel, yard	$12.50 to $13.00
Steel rails, short lengths, or equivalent	13.25 to 13.75
Rails for rolling	15.00 to 16.00
Relaying rails, nominal	25.00 to 26.00
Steel car axles	16.00 to 17.00
Iron car axles	24.00 to 24.50
No. 1 railroad wrought	13.50 to 14.00
Forge fire	9.50 to 10.00
No. 1 yard wrought, long	12.00 to 12.50
Cast borings (clean)	9.00 to 9.50
Machine-shop turnings	10.00 to 10.50
Mixed borings and turnings	8.00 to 8.50
Iron and steel pipe (1 in. diam., not under 2 ft. long)	11.50 to 12.00
Stove plate	12.00 to 13.00
Locomotive grate bars	12.50 to 13.00
Malleable cast (railroad)	14.00 to 15.00
Cast-iron car wheels	15.00 to 15.50

Prices which dealers in New York and Brooklyn are quoting to local foundries per gross ton follow:

No. 1 machinery cast	$19.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	18.00
No. 1 heavy cast, not cupola size	14.50
No. 2 cast (radiators, cast boilers, etc.)	16.00

The Shenango Furnace Co. has started to dismantle No. 4 stack, which has been inactive for many months. The furnace is of an obsolete type.

Cincinnati

Pig Iron Buying Confined to Small Lots at Unchanged Prices

CINCINNATI, Dec. 11.—Small lot buying characterized the pig iron market last week, tonnages ranging generally from carloads to 200 tons, with an occasional order being placed for 300 and 400 tons. The largest sale reported was of 1000 tons of malleable to a Tennessee melter for first quarter, the tonnage being divided between two furnaces at $22.50, Ironton, basis. One sale of 400 and another of 300 tons of silvery at the new schedule were reported to Michigan melters, as were similar sales of charcoal iron on a $26, furnace, basis. Activity in Southern iron was confined entirely to carload lots, and the price of $21, Birmingham, is being maintained by furnaces which have iron to offer. Home melters are showing interest in second and third quarters, and an inquiry is out for 1200 tons for this delivery. The L. & N. Railroad is inquiring for 700 tons and an Indiana melter for 1000. A Detroit melter wants 2000 tons for first quarter. Etna furnace of the Marting Iron & Steel Co. resumed operations last week, after having been banked for repairs.

Based on freight rates of $4.05 from Birmingham and $2.27 from Ironton we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	$25.05
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	25.55
Ohio silvery, 8 per cent	34.77
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	24.77
Basic Northern	24.77
Malleable	24.77

Sheets and Tin Plate.—Demand for sheets is better, and prices are stronger. This means principally that there are not as many mills shading the regularly established prices. Some mills have gone $4 below the market on galvanized, making 4.80c., but 3.75c. is the lowest reported on black sheets. Blue annealed continues fairly firm at 3c. Tin plate continues in excellent demand, with no reports of less than $5.50 per base box being heard.

Reinforcing Bars.—No important lettings were reported, the majority of the orders running less than 100 tons. Prices seem to be firmer, and one mill which had been quoting 2.40c. is now up to 2.50c. The low point on rerolled bars is 2.20c., mill.

Tool Steel.—Demand is made up of small inquiries, though the number of buyers shows no signs of diminishing. Conditions are fair. Prices are well maintained, the range on 18 per cent tungsten high speed steel being from 75c. to 95c. per lb.

Warehouse Business.—Local jobbers report the month to date showing up better than the same period in November. Orders are more numerous, but tonnages are lacking. Buying generally is of the hand to mouth variety. Prices continue firm, however, and no changes are contemplated.

Cincinnati jobbers quote: Iron and steel bars, 3.50c.; reinforcing bars, 3.60c.; hoops, 4.55c.; bands, 4.25c.; shapes, 3.60c.; plates, 3.60c.; cold-rolled rounds, 4.25c.; cold-rolled flats, squares and hexagons, 4.75c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, 4.80c.; No. 28 galvanized sheets 5.85c.; No. 9 annealed wire, $3.60 per 100 lb.; common wire nails, $3.50 per keg base; cement coated nails, $3.30 per keg.

Structural Activity.—A number of projects are about ready to break. One of these includes a manufacturing building, 140 x 490 ft., six stories, on which bids will be taken about Jan. 1. Another, a mill building, 300 x 500 ft., is scheduled for bids about the same time. Action has not been taken on the Third National Bank building at Dayton, and the Kentucky Hotel, Louisville, which will require about 2200 tons, will hardly be up for bids this year, although the general contract has been awarded. The Standard Sanitary Mfg. Co. took bids on a kiln building at Kokomo, Ind., 450 tons, on which an Indianapolis fabricator is low bidder and will probably be awarded the contract.

Finished Materials.—Demand for finished materials, though slightly improved, continues light. Carload orders for bars, shapes and plates are the principal activity, though occasionally an inquiry for 1000 tons of plates from tank builders is figured. Such an inquiry was in the market last week, and it is reported that the consumer was able to better the 2.50c. price by at least $2 per ton. Wire products are only in fair demand, carload orders predominating. To date there has been little contracting for first quarter, although some orders for cold-finished materials have been placed at 3c. for January shipment. Bolts and nuts are in a little better demand, and prices are inclined to be firmer. Track accessories are also in fair demand, though the railroads buying in this territory have not as yet placed orders for their next year's quotas.

Coke.—The coke market is spotty, most of the sales being for first quarter. Prices are generally firm at last week's levels. We quote:

Connellsville furnace, $4.00 to $4.25; foundry, $5.00 to $6.00; New River foundry, $10.00 to $11.00; Wise County furnace, $4.75 to $5.25; foundry, $5.75 to $7.00; by-product foundry, $8.00, Connellsville basis.

Old Material.—Locally the scrap market is quiet, but activity of dealers elsewhere has resulted in a general advance of 50c. per ton. Stove plate is in good demand locally. We note a sale of 2000 tons of heavy melting steel to a northern Ohio mill at $18.50, delivered, or 50c. below the price paid for a large tonnage in Pittsburgh the previous week.

We quote dealers' buying prices, f.o.b. cars Cincinnati:

	Per Gross Ton	
Bundled sheets	$10.50	to $11.00
Iron rails	14.00	to 14.50
Relaying rails, 50 lb. and up	28.00	to 28.50
Rails for rolling	14.00	to 14.50
Heavy melting steel	13.50	to 14.00
Steel rails for melting	13.50	to 14.00
Car wheels	13.50	to 14.00
	Per Net Ton	
No. 1 railroad wrought	12.00	to 12.50
Cast borings	9.50	to 10.00
Steel turnings	9.00	to 9.50
Railroad cast	14.50	to 15.00
No. 1 machinery cast	17.50	to 18.00
Burnt scrap	11.50	to 12.00
Iron axles	21.50	to 22.00
Locomotive tires (smooth inside)	13.50	to 14.00
Pipes and flues	8.50	to 9.00

Buffalo

Pig Iron Sold in Small Lots—Several Companies Out of the Market

BUFFALO, Dec. 11.—Only small sales have been made since the buying movement was brought to a close and there is very little inquiry engaging attention. Three producers are virtually sold out for the first quarter and are continuing the practice of scanning inquiries carefully and individually before making quotations. One interest has not entirely sold its first quarter production and expects to take on a fair tonnage at the stronger prices that have been made possible since the rush of November business. The selling policy of each furnace is indicated in the quotations they are making on request; for example, one producer has sufficient business sold to warrant asking $23 for silicon 1.75 to 2.25 whereas a furnace that did not enter the selling movement is asking $21.50 for the same grade of iron. Two producers are asking $22.50 but since the first of this month have not taken very much new business. The whole trend of talk with melters is optimistic and confidence in 1924 is general. The 50c. differential is still in effect.

We quote f.o.b., gross ton, Buffalo as follows:

No. 1 foundry, sil. 2.75 to 3.25	$22.50
No. 2 foundry, sil. 2.25 to 2.75	22.00
No. 2 plain, sil. 1.75 to 2.25	21.50
Basic	21.00
Malleable	21.00
Lake Superior charcoal	29.28

Finished Iron and Steel.—Some shading of prices on sheets for prompt shipment has been done and in several instances tonnages of black sheets have been taken at $3.75 and galvanized at $4.90. For first quarter sheet delivery, however, prices have remained firm. Considerable tin plate business has been taken by one branch office and it is generally assumed first half requirements have been filled. Bar and shape business, while generally slow, shows up better in recent days and several jobbers have come into the market.

We quote warehouse prices Buffalo as follows:
Structural shapes, 3.65c.; plates, 3.65c.; soft steel bars, 3.55c.; hoops, 4.65c.; bands, 4.35c.; blue annealed sheets, No. 10 gage, 4.30c.; galvanized steel sheets, No. 28 gage, 6.10c.; black sheets, No. 28 gage, 5c.; cold rolled round shafting, 4.45c.

Old Material.—Heavy melting steel has strengthened in this market and small tonnages have been purchased by one mill at $18. While the general tone is stronger, there has been no big selling movement and the remainder of the month is expected to be quiet.

We quote f.o.b., gross ton, Buffalo, as follows:

Heavy melting steel	$17.00 to $18.00
Low phos., 0.04 and under	20.00 to 21.00
No. 1 railroad wrought	14.00 to 15.00
Car wheels	18.00 to 18.50
Machine shop turnings	10.00 to 11.00
Cast iron borings	12.50 to 13.00
No. 1 busheling	14.00 to 15.00
Stove plate	17.00 to 17.25
Grate bars	16.00 to 16.50
Bundled sheet stampings	10.00 to 11.00
No. 1 machinery cast	18.00 to 19.00
Hydraulic compressed	14.00 to 14.50
Railroad malleable	18.00 to 18.50

St. Louis

Basic Sale of 5000 to 10,000 Tons Made—Dealers Bid Up Old Material Prices

ST. LOUIS, Dec. 11.—A few sales of pig iron were made during the last week, but they were mostly for prompt shipment. A St. Louis melter bought 5000 to 10,000 tons of basic, and a sale of 2000 tons of foundry was made by the St. Louis Coke & Iron Co. to an East Side melter. Other business was largely for carloads. It is believed now that there will be very little buying until after the first of the year, recent heavy purchases having taken care of the requirements of melters. A Peoria concern wants several thousand tons of basic, a Louisville melter is in the market for 750 tons of foundry iron for first quarter, a Chattanooga firm wants 1000 tons of malleable and a Kansas City melter wants 200 to 500 tons of foundry iron. The market is still at $2, Birmingham, for Southern make, and $23 to $23.50, Chicago, for Northern iron. The St. Louis Coke & Iron Co. sales were made on the basis of $26.50, Granite City furnace.

We quote delivered consumers' yards, St. Louis, as follows, having added to furnace prices $2.16 freight from Chicago, $3.28 from Birmingham (rail and water), $5.17 from Birmingham, all rail, and 81 cents average switching charge from Granite City:

Northern fdy., sil. 1.75 to 2.25	$25.16 to $25.66
Northern malleable, sil. 1.75 to 2.25	25.16 to 25.66
Basic	25.16 to 25.66
Southern fdy., sil. 1.75 to 2.25 (rail)	26.17

Ferroalloys.—Contracts were closed during the last week by seven melters in the district of their 1924 requirements of 50 per cent ferrosilicon. These concerns used about 2500 tons of this material during 1923. An East Side melter bought 100 tons of Bessemer 12½ per cent ferrosilicon.

Finished Iron and Steel.—The business amounts to virtually nothing. Neither jobbers nor manufacturers will enter the market until after the first of the year. The few railroad inquiries are for less than carloads. The St. Joseph Lead Co., Bonne Terre, Mo., bought 700 mine cars involving 350 tons of plates and structurals, from the American Car & Foundry Co.

For stock out of warehouse we quote: Soft steel bars, 3.35c. per lb.; iron bars, 3.35c.; structural shapes, 3.45c.; tank plates, 3.45c.; No. 10 blue annealed sheets, 4.10c.; No. 28 black sheets, cold-rolled, one pass, 4.85c.; cold drawn rounds, shafting and screw stock, 4.70c.; structural rivets, 4.15c.; boiler rivets, 4.35c.; tank rivets, ⅞-in. and smaller, 50-5 per cent off list; machine bolts, 45-5 per cent; carriage bolts, 40-5 per cent; lag screws, 50-5 per cent; hot pressed nuts, squares or hexagon blank, $2.50; and tapped, $2.50 off list.

Coke.—A radiator corporation, with branches in this district and in the East, is in the market for 2000 tons of foundry coke and there are several 200-ton inquiries before the market. More seasonal weather has helped the movement of domestic coke from the yards to the consumers, but dealers are still pretty well supplied with this fuel.

Old Material.—Again this week, advances are recorded in nearly every item on the old material list, and still there is very little buying by consumers. Heavy railroad lists closed during the week and they were all sold at good prices. Dealers have been competing keenly for this material, and they are shooting up prices, confident that consumers will enter the market soon. The position of the dealers is strengthened by the fact that the railroads are far behind in their deliveries to dealer. One line which has just gotten out a new list of offerings has unfilled orders of material sold in September. In some quarters the belief is expressed that some of the lines, sensing the eagerness of the dealers to buy material, have oversold on many items. New railroad lists include: Kansas City Southern, 500 tons; St. Louis Southwestern, 1200 tons; Kansas City Terminal, 200 tons; Chicago & Eastern Illinois, 600 tons; Chicago & Alton, 500 tons.

	Per Gross Ton	
Iron rails	$15.00 to	$15.50
Rails for rolling	17.00 to	17.50
Steel rails, less than 3 ft.	18.50 to	19.00
Relaying rails, 60 lb. and under	25.00 to	26.00
Relaying rails, 70 and over	32.50 to	33.50
Cast iron car wheels	18.50 to	19.00
Heavy melting steel	14.50 to	15.00
Heavy shoveling steel	14.50 to	15.00
Frogs, switches and guards cut apart	16.00 to	16.50
Railroad springs	18.50 to	19.00
Heavy axles and tire turnings	13.50 to	14.00
Per Net Ton		
Steel angle bars	14.00 to	14.50
Steel car axles	16.50 to	17.00
Iron car axles	24.50 to	25.00
Wrought iron bars and transoms	19.00 to	19.50
No. 1 railroad wrought	13.50 to	14.00
No. 2 railroad wrought	13.00 to	13.50
Cast iron borings	11.50 to	12.00
No. 1 busheling	13.50 to	14.00
No. 1 railroad cast	17.50 to	18.00
No. 1 machinery cast	18.50 to	19.00
Railroad malleable	15.50 to	16.00
Machine shop turnings	9.00 to	9.50
Champion bundled sheets	8.00 to	8.50

Birmingham

French Pipe Company Takes Orders in Competition with Southern Companies

BIRMINGHAM, Dec. 11.—American-made cast iron pipe felt the French competition again the past week, announcement being made that the city of Pasadena, Cal., had given a contract for 1000 tons to a French pipe maker at Pont-à-Mousson, France. The pipe bought by Pasadena is said to be light weight, high tensile iron, made according to German specifications, the dimensions of which follow the metric system. It is understood that the price paid for the foreign pipe averages about $50 per ton for all sizes, f.o.b. Pasadena, which is some $8 to $10 less than the pipe can be sold by American manufacturers. The light weight French pipe at Pasadena competed with American-made De-Lavaud pipe, as well as the standard sand cast product. Among the lettings reported the past week were 1154 tons for Kansas City, Mo., 240 tons for Dallas, Tex., and 348 tons for Birmingham, Ala., received by the American Cast Iron Pipe Co. Cast iron pipe prices, Birmingham, are:

4-in. water, $51; 6-in., $47; larger sizes, $46; 4-in. gas, $56; 6-in., $52; standard sanitary pipe, $55; heavy gage, $45.

Pig Iron.—Pig iron sales in the Birmingham district are tapering off some, but there is a strong feeling in the market and the surplus stock is being worked down a little. Prompt delivery is being maintained and melters of iron are being supplied as desired. Delivery of pig iron is being kept up as many of the smaller melters are pushing their production in order to get goods out before the holiday season starts in. Many of the iron-using industries of this section will take a week to 10 days off for the Yuletide, repairs to be given attention during that time. In many instances, stock on hand will be reduced to the minimum, so that inventories will not be too large. Some of the soil pipe con-

cerns report less stock on hand than at this time last year and a few claim to have no stock at all in warehouses.

We quote per gross ton f.o.b. Birmingham district furnace as follows:

Foundry, silicon 1.75 to 2.25	$21.00
Basic	21.00
Charcoal, warm blast	33.00

Finished Material.—The steel plants of the Birmingham district are well supplied with business and the steady operation will be continued for an indefinite period. Further export rail business is said to have been placed in this district and the activity of this department promises to be of an indefinite period. In several departments, effort for the largest possible production will be sought on the turn of the year.

Coal and Coke.—The Alabama coal operators are still in need of orders for steam coal, but even at that the production is around 345,000 tons a week. Statistics already show that Alabama will show an increased production of coal in 1923 as compared with 1922. The coke market shows no change, by-product foundry coke selling between $5 and $6 per ton and the beehive oven product a little above that price.

Old Material.—A little better feeling is noted in the scrap iron and steel market though contracts for any period into 1924 are being accepted. Small lots of old material have been sold recently and prompt delivery is being accomplished. There is plenty of stock on hand and dealers assert that they can get all the stock they want and will keep up with the demand.

We quote per gross ton f.o.b. Birmingham district yards, nominal prices, as follows:

Cast iron borings, chemical	$16.00
Heavy melting steel	12.00
Railroad wrought	14.00
Steel axles	17.00
Iron axles	20.00
Steel rails	13.00
No. 1 cast	18.50
Tram car wheels	15.50
Car wheels	15.00
Stove plate	14.00
Machine shop turnings	6.00
Cast iron borings	8.00

Boston

Pig Iron Market Grows Less Active as Inventory Time Draws Near

BOSTON, Dec. 11.—The New England melt of iron has fallen off this month and with inventory just ahead, business in pig iron is slowing down. Small pig iron tonnages constituted business in this territory the past week, no furnace representative reporting aggregate sales of more than 600 tons. Eastern and central Pennsylvania, Buffalo, Alabama and Virginia irons all figured in recent dealings. No. 2X eastern Pennsylvania sold at $27.15 delivered and No. 1X at $27.65; Buffalo No. 2X at $26.91 and No. 1X at $27.91; and Alabama at $30.60 base. Virginia No. 2X sold at $31.92 delivered, but is obtainable at $29.92 if round tonnages are taken. Not much buying is expected until after Jan. 1. After then it is figured New England foundries, under normal business conditions, will require 40,000 to 50,000 tons for first quarter melt.

We quote delivered prices on the basis of the latest reported sales as follows, having added $3.65 freight from eastern Pennsylvania, $4.91 from Buffalo, $5.92 from Virginia, and $9.60 from Alabama:

East. Penn., sil. 2.25 to 2.75	$27.15 to	$28.15
East. Penn., sil. 1.75 to 2.25		26.65
Buffalo, sil. 2.25 to 2.75	27.41 to	27.91
Buffalo, sil. 1.75 to 2.25	26.91 to	27.41
Virginia, sil. 2.25 to 2.75	30.92 to	32.42
Virginia, sil. 1.75 to 2.25	30.92 to	31.92
Alabama, sil. 2.25 to 2.75		31.10
Alabama, sil. 1.75 to 2.25		30.60

Shapes and Plates.—Stone & Webster today will award approximately 2500 tons of structural steel for a Fall River, Mass., power plant. Bids for this steel took a wide range. The American Bridge Co. is awarded 1000 tons for a silk mill at Dividend, Conn., and is the low bidder on a Haverhill, Mass., bridge calling for about 200 tons of steel. Bids are asked on 1000 tons of steel for a Worcester, Mass., office building, and Springfield, Mass., will shortly call for bids on a large bridge. Shapes are offered at 2.40 cents to 2.50 cents Pittsburgh, and 2.35 cents on plates can be done.

Coke.—The status of the by-product foundry coke market has not changed perceptibly, except, perhaps, that rather heavy stocking of domestic fuel by New England coke makers indicates curtailed oven operations within the near future unless more seasonable weather is experienced before the turn of a new year. Foundry coke requirements are comparatively small, most iron melters having sufficient on hand to carry over Jan. 1. Both the New England Coal & Coke Co. and the Providence Gas Co. quote foundry coke $12.50 delivered in New England. The spread between that figure and the Connellsville foundry coke delivered price is smaller than noted in many weeks.

Old Material.—A further advance in prices for scrap used by steel mills averaging 50 cents a ton throughout the list has been made since the Carnegie Steel Co.'s recent purchase. The American Steel & Wire Co., Worcester, Mass., is credited with having bought a round tonnage of heavy melting steel at $15 delivered, but actual transactions otherwise have been small, mostly on a basis of $12 on cars shipping point, an advance of $1. Some dealers are holding at $13 a ton. Blast furnace borings and turnings are a little more active at $8.10 a ton on cars, or close to that price, and chemical borings at $10.25. On the other hand, comparatively little is being done in machine shop turnings and rolling mill borings, yet prices are firmer. More inquiry is noted for forged scrap, but the market is not active. One local firm is bidding as high as $10 for selected No. 1 material, but that price is exceptional, the general market on 30-in. bundles being around $9 a ton on cars. Additional car lot sales of No. 1 machinery cast to New England foundries at $22 to $22.75 and occasionally $23 are noted, but the market for No. 2 cast is stagnant and that for stove plate practically so. Railroad malleable delivered prices have been lifted 50 cents a ton, but dealers report no market for this material.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast	$22.00 to $23.00
No. 2 machinery cast	20.00 to 21.00
Stove plates	15.50 to 16.00
Railroad malleable	19.00 to 19.50

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	$12.00 to $13.00
No. 1 railroad wrought	13.00 to 13.50
No. 1 yard wrought	11.00 to 11.50
Wrought pipe (1-in. in diam., over 2 ft. long)	10.00 to 11.00
Machine shop turnings	8.00 to 8.50
Cast iron borings, chemical	10.00 to 10.50
Cast iron borings, rolling mill	7.50 to 8.50
Blast furnace borings and turnings	8.00 to 8.50
Forged scrap and bundled skeleton	8.50 to 9.00
Shafting	17.00 to 18.00
Rails for rolling	13.00 to 13.50

Detroit Scrap Market

DETROIT, Dec. 11.—There has been considerable activity in the Detroit scrap market in the last week involving a number of small sales and the letting by the Michigan Central of 4000 tons of railroad waste material. The market has a firm note, heavy melting and shoveling steel and hydraulic compressed registering advances of 50c. per ton. The seasonal decline in melting is noticeable with the general feeling for first quarter business one of optimism.

The following prices are quoted on a gross ton basis f.o.b. cars producers' yards, excepting stove plate, No. 1 machinery cast and automobile cast, which are quoted on a net ton basis:

Heavy melting steel	$14.50 to $15.00
Shoveling steel	13.50 to 14.50
Borings	10.00 to 11.00
Short turnings	10.00 to 11.00
Long turnings	9.50 to 10.00
No. 1 machinery cast	17.00 to 18.00
Automobile cast	23.50 to 24.00
Hydraulic compressed	11.50 to 12.00
Stove plate	15.00 to 16.00
No. 1 busheling	10.00 to 11.00
Sheet clippings	8.75 to 9.25
Flashings	10.50 to 11.00

Cleveland

Orders for Bars Booked—Heavy Buying of Sheets by Automobile Companies

CLEVELAND, Dec. 11.—Business is developing in first quarter contracts for steel bars and orders were booked during the week by local consumers for 4000 to 5000 tons, including one 2000-ton lot. All the business was taken at the regular 2.40c. price. In Detroit some of the leading automobile companies, including the Ford Motor Co., placed round tonnages for the first quarter in steel bars in both carbon and alloy steel, sheets and other mill products. However, some of the automobile companies, following a cautious policy, have not bought very far ahead. Leading automobile companies have placed contracts with parts makers for forging, axles and other parts in liberal quantities, indicating large production schedules for the first quarter. It is understood that a large percentage of the parts business has been taken at rather low prices. There is an improvement in the volume of inquiry for steel bars in lots of 100 tons and under. Locally, a manufacturer of automobile parts is expected to close this week for 15,000 tons of carbon and alloy steel bars. While the business booked for the first quarter has not yet reached the proportions of a general buying movement, the activity has resulted in an improvement in the general tone of the market. In the structural field, there is a decided gain in inquiry. Several buildings came out for figures during the week requiring 6000 tons of steel. The New York Central Railroad is reported to be working on plans for important bridge and grade crossing work which is expected out early in the year. The plate market has become slightly more active and prices have become a little firmer, although 2.40c. has not disappeared. Hoops are firm at a minimum of 3c., but a $2 a ton concession is being made in some cases from the 3c. price on bands.

Jobbers quote steel bars, 3.36c.; plates and structural shapes, 3.46c.; No. 28 black sheets, 4.40c. to 4.65c.; No. 28 galvanized sheets, 5.60c. to 5.80c.; No. 10 blue annealed sheets, 3.60c. to 4c.; cold rolled rounds, 3.90c.; flats, squares and hexagons, 4.40c.; hoops and bands, 1 in. and wider and 20 gage or heavier, 4.16c.; narrower than 1 in. or lighter than No. 20 gage, 4.66c.; No. 9 annealed wire, $3.50 per 100 lb.; No. 9 galvanized wire, $3.95 per 100 lb.; common wire nails, $3.60 base per 100 lb.

Pig Iron.—Buying has further tapered off, and the total volume of sales during the week was very light. There are few foundries that did not purchase some iron during the buying movement, and a number are expected to make additional purchases, provided business opens up well in January. The market is firm, with a very little change in the price situation. While some attempt was made to boost local foundry iron to $23 at furnace for Cleveland delivery, the market has settled down to a $22.50 basis. One producer is holding to the same price for out-of-town shipment, although iron can still be had in Cleveland at $22 at furnace for outside delivery. Other Lake furnaces are holding to a minimum of $22.50. In the Valley district, quotations range from $22 to $22.50, although the latter price has become more common than a week ago. One producer during the week sold 5000 tons in foundry and malleable iron, including two 1000-ton lots in the former grade. A Cleveland foundry purchased 500 tons of foundry iron and a few small lot sales were made in the northern Ohio territory. The melt is holding up well, and some of the furnaces are shipping more iron than during November. Steel making iron is inactive. Southern foundry iron is firm at $21, Birmingham, but very quiet.

Quotations below, except on basic and low phosphorus iron, are delivered Cleveland, and for local iron include a 50c. switching charge. Ohio silvery and Southern iron prices are based on a $3.02 freight rate from Jackson and $6 rate from Birmingham:

Basic, Valley furnace	$21.00
Northern No. 2 fdy., sil. 1.75 to 2.25	23.00
Southern fdy., sil. 1.75 to 2.25	27.00
Malleable	23.00
Ohio silvery, 8 per cent	35.52
Standard low phos., Valley furnace 29.00 to	30.00

Iron Ore.—Stocks of Lake Superior ore at Lake Erie docks were over 1,000,000 tons greater at the close of the season of navigation this year than they were at the same time a year ago. On Dec. 1 there was 8,756,505 gross tons of ore on Lake Erie docks as compared with 9,989,313 tons on the same day last year and with 8,097,488 tons on Oct. 1. Receipts at Lake Erie ports during November were 3,895,006 tons and for the season 43,599,050 tons, as compared with 31,713,645 tons during the corresponding period last year. Shipments from Lake Erie docks for the season up to Dec. 1 were 32,662,186 tons, as compared with 21,095,473 tons during the same period of 1922. Lake front furnaces at Lake Erie ports received 9,158,453 tons of ore during the season, as compared with 8,507,194 tons during 1922. Receipts at other than Lake Erie ports during the season were 14,656,472 tons, of which 6,988,427 tons was delivered at South Chicago, 3,982,161 tons at Gary and 1,621,688 tons at Indiana Harbor.

Semi-Finished Steel.—Considerable inquiry has come out for sheet bars for the first quarter, particularly from mills that have been booking large sheet tonnages from automobile manufacturers, but no sales are reported. Buyers insist that the ruling price of $42.50 is too high and are holding off in an attempt to secure concessions.

Bolts, Nuts and Rivets.—Bolt and nut prices are being firmly held at the regular quotations as a result of the firmer attitude recently adopted by manufacturers. Specifications and current orders are light. A small amount of contracting is being done for the first quarter. Rivets are firmly held at 2.90c., base, and some first quarter contracts have been taken at this price.

Reinforcing Bars.—New demand is fair. The Franklin Steel Works has taken 150 tons for plant addition for the P. A. Geier Co., Cleveland. Inquiry includes 500 tons of billet steel bars for a factory for the Libby-Owens Sheet Glass Co., Toledo. The Ohio Highway Commission has announced a road building program during 1924 of over $25,000,000 and this work will require a great deal of reinforcing steel. Rail steel bars have settled down to a common quotation of 2.10c.

Alloy Steels.—Leading Detroit automobile companies have in the past week or two placed round tonnages of alloy steels for the first quarter and are specifying fairly heavy on these contracts for January shipment. Mills specializing on alloy steels are rapidly filling to capacity for the first quarter and expect to be comfortably filled for the first half of the year. Producers announce the abandonment of the $10 gross ton size extra that has prevailed on square billets between 4 x 4 and 2½ x 2½ in. and the adoption of the net ton bar price on all billets smaller than 4 x 4 in., which price heretofore has applied only to sizes smaller than 2½ in. sq.

Sheets.—The automobile industry in Detroit has come in the market and during the week purchased a heavy tonnage of full finished sheets. Some contracted for the first quarter and others covered for their requirements for shorter periods. While pressure has been exerted to force automobile body sheets down $5 a ton, prices are holding firmly to 5.35c. in this territory. The demand for sheets in other grades has improved, but buyers lack confidence that present prices will be maintained and few are buying for the first quarter. Mills are in need of tonnage for December rolling and are freely quoting black sheets at 2.75c. for immediate specifications, but are holding pretty firmly to 2.85c. for the first quarter.

Coke.—A moderate volume of business has developed in foundry coke for the first half, with quotations ranging from $6.25 to $7 for standard Connellsville makes. This is about $1 a ton above the current prices for the more moderately priced grades, which are quoted down to $5.25 for prompt shipment.

Old Material.—Prices have further advanced 25c. to 50c. a ton in spite of a very limited demand. Local mills are not in the market, and there is not much activity in other Ohio districts. A Canton consumer is understood to have bought a fair tonnage of heavy melting steel during the week, and dealers are offering $17.50 to $17.75 for scrap to fill these orders. The re-

cent advance, instead of bringing out a more plentiful supply of scrap, seems to have caused dealers to hold almost more closely to their material, apparently thinking that a buying movement will develop that will cause further advance. On the other hand, there is some doubt whether prices will be maintained at present levels.

We quote dealers' prices f.o.b. Cleveland per gross ton:

Heavy melting steel	$16.50 to $17.00
Rails for rolling	16.75 to 17.25
Rails under 3 ft	17.25 to 17.50
Low phosphorus melting	18.50 to 19.00
Cast borings	13.25 to 13.50
Machine shop turnings	12.50 to 13.00
Mixed borings and short turnings	13.25 to 13.75
Compressed sheet steel	13.25 to 13.75
Railroad wrought	15.00 to 16.00
Railroad malleable	19.75 to 20.25
Light bundled sheet stampings	11.25 to 11.50
Steel axle turnings	14.00 to 14.50
No. 1 cast	21.00 to 22.00
No. 1 busheling	13.00 to 13.25
Drop forge flashings	12.75 to 13.00
Railroad grate bars	18.00 to 18.50
Stove plate	18.00 to 18.50
Pipes and flues	13.00 to 13.50

Philadelphia

Pig Iron and Steel Markets Quiet, With No Definite Trend Indicated

PHILADELPHIA, Dec. 11.—Reduced operations at most of the Eastern steel mills will mark the remaining working days of the year. One company will shut down most of its departments on Dec. 15, while others are running lightly on a hand-to-mouth basis with nothing to indicate that the remainder of December will be any better than the first 10 days have been. Naturally, interest is centered on prospects for renewed buying of steel in January. A spirit of optimism pervades the sales departments of steel companies as to a revival of activity that is remarkable in view of the lack of tangible factors to explain it. Steel consumers apparently are not as convinced as are sellers that there will be a substantial revival of buying and aside from tin plate there is little or no first quarter contracting. Two railroads have come into the market for their first quarter requirements of plates, shapes and bars, one inquiry calling for 2000 tons and another for 1000 tons, but the railroads in this district appear to be in no hurry to buy, as is evidenced by the continued holding off of the Chesapeake & Ohio on the 2000 cars it inquired for several weeks ago, and the same action by the Philadelphia & Reading on 1000 cars.

The pig iron market has turned very quiet, but moderate activity in scrap continues and prices on many grades are higher than a week ago.

Ferroalloys.—The ferromanganese market has strengthened slightly. One producer states that is minimum is now $109, furnace, while another, practically out of the market, is quoting $115. There has been no change in the British price, which remains at $110, seaboard.

Ore.—Users of manganese ore have pretty well used up their stocks and inquiries are now in the market for a total of about 50,000 tons. Recent sales of Caucasian ore to Eastern furnaces totaled 30,000 tons at 40c. to 42c. per unit, duty not paid. A German shipment of 1020 tons of iron ore was received at this port last week, also 728 tons of manganese ore from British India.

Pig Iron.—Total sales of foundry iron in the past week by local pig iron sales offices probably did not exceed 10,000 tons, if they were that much. In basic there was a transaction involving 3000 tons at a slight advance in price as compared with the last sale. Eastern Pennsylvania furnaces continue to quote $23, furnace, for No. 2 plain and $23.50, furnace, for No. 2 X, but occasional concessions are being made, particularly to equalize freight rates. Two Virginia cast iron pipe companies have recently contracted for a total of about 22,000 tons of foundry iron, one company having bought the most of its 12,000 tons from an Alabama furnace. A recent sale of 1500 tons of Virginia iron to one of these companies was on the basis of $24, furnace, for No. 2 plain.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia and include freight rates varying from 76 cents to $1.63 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil.	$23.76 to $24.13
East. Pa. No. 2X, 2.25 to 2.75 sil.	24.26 to 24.63
East. Pa. No. 1X	24.76 to 25.13
Virginia No. 2 plain, 1.75 to 2.25 sil.	29.17 to 30.17
Virginia No. 2X, 2.25 to 2.75 sil.	30.17 to 30.67
Basic delivered eastern Pa.	23.25 to 23.50
Gray forge	23.00 to 23.50
Malleable	24.25 to 24.50
Standard low phos. (f.o.b. furnace)	27.50 to 28.00
Copper bearing low phos. (f.o.b. furnace)	28.00

Semi-Finished Steel.—Billets remain nominally at $40, Pittsburgh, for rerolling quality and $45 for forging quality. There are no sales of importance. About 200 tons of steel blooms from Belgium arrived here last week.

Plates.—A leading producer of plates in the East ran its sheared mills practically full last week, but this week is operating only its universal mill. All of the Eastern plate mills are running on a hand-to-mouth basis. One of the smaller mills attained a 50 per cent operation in November, but scarcely any of the other mills did that well and December operations will probably fall below those of last month. Orders for more than 50 tons are exceptional. With the demand at such a low point, there is no test of prices, which remain unchanged at 2.40c., Pittsburgh, generally quoted by Eastern mills, and 2.50c., Pittsburgh, usually named by the Pittsburgh mills.

Structural Steel.—The demand for structural shapes in this territory is extremely light. Building jobs are few and small. Quotations of 2.40c., Pittsburgh, are general on anything desirable, and even mills which held for some time to 2.50c. in the face of 2.40c. competition have been obliged to meet the lower price in exceptional cases.

Bars.—There is surprisingly little talk of anything under 2.40c., Pittsburgh, on steel bars in this territory in view of reports of 2.30c., Pittsburgh, having been quoted in other sections, especially on reinforcing bars. Consumers are not interested in contracting for first quarter. A few reservations for first quarter have been made by users of hot-rolled strips and bands, prices quoted ranging from 2.90c. to 3c., Pittsburgh. On cold-rolled strip, usual prices are 4.85c. to 4.90c., Pittsburgh.

Bolts, Nuts and Rivets.—Makers of bolts, nuts and rivets are ready to accept first quarter contracts, but consumers are showing little readiness to cover. Bolts for first quarter are quoted on the basis of 60 and 10 per cent off list for large machine bolts, this being 10 per cent higher than invoice prices of recent shipments.

Warehouse Business.—Local jobbers are doing a fair business. Prices are unchanged, for local delivery being as follows:

Soft steel bars and small shapes, 3.47c.; iron bars (except bands), 3.47c.; round edge iron, 3.75c.; round edge steel, iron finished, 1½ x ½ in., 3.75c.; round edge steel planished, 4.55c.; tank steel plates, ¼ in. and heavier, 3.57c.; tank steel plates, ⅜ in., 3.82c.; blue annealed steel sheets, No. 10 gage, 4.10c.; black sheets, No. 28 gage, 5.15c.; galvanized sheets, No. 28 gage, 6.25c.; square twisted and deformed steel bars, 3.57c.; structural shapes, 3.57c.; diamond pattern plates, ¼-in., 5.40c.; ⅜-in., 5.60c.; spring steel, 5c.; round cold-rolled steel, 4.35c.; squares and hexagons, cold-rolled steel, 4.85c.; steel hoops, 1 in. and wider, No. 20 gage and heavier, 4.27c.; narrower than 1 in., all gages, 4.77c.; steel bands, No. 12 gage to ⅜-in., inclusive, 4.27c.; rails, 3.47c.; tool steel, 8.50c.; Norway iron, 7c.

Coke.—At least four eastern Pennsylvania blast furnaces have contracted for all or part of their first quarter coke requirements. For January delivery only contracts were closed at $4.25, Connellsville, but $4.40 was the price fixed on supplies for the entire quarter. Prompt furnace coke is still available at $4, but the views of producers for first quarter have now strengthened, one leading producer quoting $5, Connellsville.

Old Material.—The sudden rise in the old material market has proved perplexing to buyers and sellers alike. The perplexing feature of it is that there has been no gain in finished material bookings, and some doubt is expressed as to whether prices of scrap will show further gains until there is a renewal of finished steel buying. A leading Eastern steel company is reported to have bought heavy melting steel at $17, delivered, while a small tonnage was sold to a mill in the Pittsburgh district at $18.50, delivered, which is 50c. below the price paid by the Carnegie Steel Co. on its recent purchase. An Eastern steel company paid $15 for turnings and bundled sheets and $17 for stove plate. Pipe has been sold at $16.50. English mills have inquired as to the possibility of buying steel scrap here, but the price quoted, $24, delivered at English port, is above the level of the market there and it is doubtful whether business will result. Italy is also in need of scrap and it is quite possible that some of the scrap reclaimed from U. S. Navy ships at Norfolk, Va., may be shipped to that country as the ocean freight rate is little more than the rail rate to our mills.

We quote for delivery at consuming points in this district as follows:

No. 1 heavy melting steel	$16.50 to $17.00
Scrap rails	16.50 to 17.00
Steel rails for rolling	19.00 to 19.50
No. 1 low phos., heavy 0.04 and under	22.00 to 23.00
Couplers and knuckles	20.00 to 21.00
Cast-iron car whee's	19.50 to 20.00
Rolled steel wheels	20.00 to 21.00
No. 1 railroad wrought	18.50 to 19.00
No. 1 yard wrought	16.00 to 17.00
No. 1 forge fire	14.50 to 15.00
Bundled sheets (for steel works)	14.50 to 15.00
Mixed borings and turnings (for blast furnace use)	11.50 to 12.00
Machine shop turnings (for steel works use)	14.50 to 15.00
Machine shop turnings (for rolling mill use)	14.50 to 15.00
Heavy axle turnings (or equivalent)	15.00 to 15.50
Cast borings (for steel works and rolling mills)	14.00 to 15.00
Cast borings (for chemical plants)	15.00 to 16.00
No. 1 cast	20.00 to 21.00
Heavy breakable cast (for steel plants)	17.50 to 18.00
Railroad grate bars	17.00 to 17.50
Stove plate (for steel plant use)	17.00 to 17.50
Railroad malleable	18.00 to 18.50
Wrought iron and soft steel pipes and tubes (new specifications)	16.50 to 17.00
Shafting	21.00 to 22.00
Steel axles	20.00 to 21.00

British Iron and Steel Market

Politics and Holidays Become Factors—Japanese Demand Slackens—Two Rail Orders Placed—Ruhr Developments Uncertain

(By Cable)

LONDON, ENGLAND, Dec. 11.

Pig iron is firm but the tone is quieter, owing to the political disturbance, coupled with the near approach of the holidays. Recent heavy buying included sales covering the whole of next year. Cleveland makers are well placed, owing to the limited output. No further expansion yet is contemplated. Domestic trade prospects are brighter but export sales still are poor.

Hematite is firm and active but prompt supplies are scarce. Foreign ore is improving. Bilbao Rubio is being sold at 24s. ($5.23), c.i.f. Tees. West African ore brings 22½s. ($4.90).

Domestic buying of steel is improving, especially in the plate, bolt and rivet departments. Some rollers are well booked for many weeks and concessions are less easily obtainable. Merchant steel buying is quiet.

Continental business is affected by the Ruhr developments. Foreign buyers are postponing purchases, owing to the uncertainties of the future. Sterling quotations generally are unaltered.

Wire rods have been sold in the United Kingdom at £9 7½s. ($40.88), f.o.b. Hamburg. British consumers of semi-finished steel are inclined to buy if prices sufficiently attractive offer.

In France 116 blast furnaces were blowing Nov. 1. The Chemins de Fer de l'Est (Eastern Railroad) has placed an order for 16,000 tons of rails among the Société Metallurgique de Senelle-Maubeuge at Longwy, de Wendel et Cie. at Joeuf, the Société Anonyme des Acieries de Longwy at Mont-Saint-Martin, the Société Anonyme des Hauts-Fourneaux de la Chiers at Longwy Bas, the Compagnie des Forges de Chatillon, Commentry et Neuves-Maisons, the Société Anonyme des Laminoirs, Hauts-Fourneaux, Forges, Fonderies et Usines de la Providence and the Société Anonyme des Acieries de Micheville.

Franco-Belgian works have secured a South Manchurian Railroad order for 12,000 tons of rails.

Tin plate is strong on continued domestic and export demand. Some makers have sold up to 24½s. ($5.34) basis, IC, f.o.b. Second-hand have been sold on 23¾s. ($5.18) basis, IC, f.o.b. Works' order books are well filled for two or three months.

Galvanized sheets are easier on poor foreign demand. Makers have sold 24-gage corrugated in bundles at £18 15s. (3.65c. per lb.), f.o.b. Japanese demand for thin gages is stagnant. Other markets are not keen buyers, owing to the high prices quoted.

Black sheets are quieter. The Far East is inquiring for January-February shipment, but makers generally are unable to accept the orders, owing to full order books. Other markets are quiet.

We quote per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalent figured at $4.36 per £1, as follows:

Durham coke, delivered	£1	18½s.	to £1	19s.		$8.39 to	$8.50
Bilbao Rubio ore†	1	4				5.23	
Cleveland No. 1 foundry	5	7½				23.43	
Cleveland No. 3 foundry	5	0				21.80	
Cleveland No. 4 foundry	4	19				21.58	
Cleveland No. 4 forge	4	18				21.36	
Cleveland basic	5	0				21.80	
East Coast mixed	5	1½ upward				22.13 upward	
East Coast hematite	4	19	to 5	0		21.58 to	21.80
Ferromanganese	17	0				74.12	
Ferromanganese*	17	0				74.12	
Rails, 60 lb. and up	8	10	to 9	10		37.06 to	41.42
Billets	8	0	to 8	10		34.88 to	37.06
Sheet and tin plate bars, Welsh	8	18¾				38.97	
Tin plates, base box	1	3¾	to 1	4¼		5.18 to	5.29
						C. per Lb.	
Ship plates	9	10	to 10	0		1.85 to	1.95
Boiler plates	13	0	to 13	10		2.53 to	2.63
Tees	9	15	to 10	5		1.90 to	1.99
Channels	9	0	to 9	10		1.75 to	1.85
Beams	8	15	to 9	5		1.70 to	1.80
Round bars, ¾ to 3 in.	10	5	to 10	15		1.99 to	2.09
Galvanized sheets, 24 g.	18	15	to 19	0		3.65 to	3.70
Black sheets, 24 gage	14	0				2.72	
Black sheets, Japanese specifications	15	5				2.97	
Steel hoops	12	0	& 12	10*		2.34 &	2.43*
Cold rolled steel strip, 20 gage	17	12½				3.43	
Cotton ties, Indian specifications	15	0				2.92	

*Export price. †Ex-ship, Tees, nominal.

Continental Prices, All F. O. B. Channel Ports

(Nominal)

Foundry pig iron:							
Belgium	£4	15s.	to £5	0s.		$20.71 to	$21.80
France	4	15	to 5	0		20.71 to	21.80
Luxemburg	4	15	to 5	0		20.71 to	21.80
Billets (nominal):							
Belgium	6	7½				27.80	
France	6	7½				27.80	
Merchant bars:						C. per Lb.	
Belgium	7	10	to 8	0		1.46 to	1.56
Luxemburg	7	10	to 8	0		1.46 to	1.56
France	7	10	to 8	0		1.46 to	1.56
Joists (beams):							
Belgium	7	0	to 7	2½		1.36 to	1.39
Luxemburg	7	0	to 7	2½		1.36 to	1.39
France	7	0	to 7	2½		1.36 to	1.39
Angles:							
Belgium	8	0	to 8	5		1.56 to	1.61
⅛-in. plates:							
Belgium	8	0	to 8	2½		1.56 to	1.58
Germany	8	0	to 8	2½		1.56 to	1.58
⅜-in. plates:							
Luxemburg	8	0	to 8	2½		1.56 to	1.58
Belgium	8	0	to 8	2½		1.56 to	1.58

Pilling & Co., pig iron, coke and coal merchants, Philadelphia, who have occupied offices in the Real Estate Trust Building, that city, for the past 15 years, will move this week to offices in the new Bankers' Trust Building.

FABRICATED STEEL BUSINESS

Building Activity in New York Accounts for Large Share of Current Lettings

Of structural steel building awards in the past week, given below, 15,600 tons of a total of nearly 24,000 tons is accounted for by work in New York City, which is having a winter building boom eclipsing that of any other city or section of the country. Pending jobs reported total nearly 23,000 tons, of which more than 13,000 tons is for jobs in New York. An office building, 8500 tons, and subway construction, 4400 tons, are the week's largest awards.

Lefcourt-Marlborough Building, Broadway and Thirty-sixth Street, New York, 4500 tons, definitely awarded to Taylor-Fichter Steel Construction Co., as predicted in last week's report.

Public School No. 99, New York, 1300 tons, to Hay Foundry & Iron Works.

Loft building on West Thirty-eighth Street, New York, 900 tons, to Hay Foundry & Iron Works.

Office building at Broadway and Fortieth Street, New York, 8500 tons, to Hay Foundry & Iron Works.

New York Edison Co., Sub-station, Horatio Street, New York, 500 tons, to Hedden Iron Construction Co.

Ohio Edison Co., power plant at Toronto, Ohio, 2000 tons, to McClintic-Marshall Co.

High school, Bridgeport, Conn., 300 tons, to Easton Structural Steel Co

Virginian Railway power plant at Narrows, Va., 2000 tons, to Virginia Bridge & Iron Works.

Route No. 52, New York subways, Queens Borough, 4400 tons, to American Bridge Co.

Standard Sanitary Mfg. Co., kiln building, Kokomo, Ind., 750 tons, Indianapolis fabricator low bidder.

Missouri River bridge, Mobridge, S. D., 1000 tons, to Minneapolis Steel & Machinery Co.

Carbon Steel Castings Co., foundry, Lancaster, Pa., 275 tons, to American Bridge Co.

Elks' Clubhouse, Omaha, Neb., 153 tons, to Omaha Structural Steel Co.

Yazoo & Mississippi Valley Railroad, passenger station at Baton Rouge, La., 112 tons, to Charles S. Schillo Co.

Manufacturing building, Phillipsdale, Mass., 200 tons, to Eastern Bridge & Structural Co.

Bourne Fuller Co., Cleveland, addition to a steel warehouse, 600 tons, to Massillon Bridge & Structural Co.

Richmond Brothers Co., Cleveland, addition, 150 tons, to Republic Structural Iron Co.

Three 80,000-bbl. oil tanks for a Los Angeles company, 900 tons, to Chicago Bridge & Iron Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

Public School No. 36, New York, 400 tons.

Apartment building at 111 East Eightieth Street, New York, 400 tons.

Apartment building at Kew Gardens, Long Island, 250 tons.

India House, Hanover Square, New York, addition, 150 tons.

Bank of America, Wall Street, New York, 4000 tons.

Bing & Bing, apartment building on East Fiftieth Street, New York, 600 tons.

Bank of Manhattan, Fresh Pond, Long Island, 100 tons.

Home Insurance Co., Baltimore, Md., office building, 500 tons.

Bellevue Hospital, New York, addition, 1000 tons.

Hillside Coal Co., coal breaker at Pittston, Pa., 700 tons.

Magoba loft building, West Thirty-sixth Street, New York, 1800 tons.

Dortoe Realty Co., loft building, West Thirty-eighth Street, New York, 1500 tons.

Sadowsky loft building, West Thirty-eighth Street, New York, 2000 tons.

Professional building, Sixtieth Street, New York, 400 tons.

Warehouse, Fifty-eighth Street, New York, 900 tons.

Board of Commissioners, Port of New Orleans, dock, Claiborne Avenue landing, 1700 tons.

Ford Motor Co., assembling plants at Omaha, Neb., and Memphis, Tenn., approximately 500 tons each.

Office building, Worcester, Mass., 1000 tons.

Elks' Clubhouse, Milwaukee, 300 tons; bids being taken by the Raulf Co., 53 Patton Building, general contractor.

Libbey-Owens Sheet Glass Co., Toledo, Ohio, addition, 1200 tons.

State of West Virginia, Charleston, State Capitol office building, 1000 tons.

United Savings & Loan Co., Cleveland, building, 1200 tons. General contract placed with the Hunkin-Conkey Construction Co.

National Biscuit Co., plant in Cleveland, 200 tons.

Rapid Transit Land Co., Cleveland, office building, 140 tons. General contract placed with the A. A. Lane Construction Co.

Court House addition, Mansfield, Ohio, 200 tons.

Erie County Court House addition, Buffalo, 300 tons.

RAILROAD EQUIPMENT BUYING

Wabash Railroad Buys 2000 Cars and the Ann Arbor 500—No New Inquiries

Railroads are showing no haste to make freight car purchases nor to issue the inquiries for cars, which were expected to develop before the end of the year. The week's orders total only 2518 cars, of which the Wabash bought 2000 and the Ann Arbor Railroad 500.

The Wabash Railroad has placed orders for 2000 cars, 1750 composite box cars, which will be fabricated by the Pressed Steel Car Co., and 250 gondolas, to be built by the General American Car Co.

The Ann Arbor Railroad has placed an order for 500 box cars with the Standard Tank Car Co.

The Sinclair Refining Co. has purchased 18 standard gage coke cars from the Koppel Industrial Car & Equipment Co.

The Seaboard Air Line has ordered 4 combination baggage and mail cars from the American Car & Foundry Co.

The Alabama & Vicksburg has placed 5 coaches, 2 passenger and baggage and 1 baggage car with the American Car & Foundry Co.

The Central of Georgia has ordered 2 partition coaches and 4 straight coaches from the American Car & Foundry Co.

The Gulf, Mobile & Northern is inquiring for 2 baggage and mail cars, 2 partition coaches and 2 straight coaches.

Car Orders Come Slowly

YOUNGSTOWN, Dec. 11.—Although car builders in the Youngstown district are figuring on a number of substantial inquiries recently put forth, and forecast that within the next few weeks orders for from 25,000 to 30,000 railroad cars will be placed, current activity is somewhat limited. Placing of the business now before car makers will bring out a large volume of iron and steel tonnage.

Due to the temporarily declining volume of car business, the Standard Tank Car Co. at Masury, Ohio, has been placed on a single 8-hr. turn basis. Heretofore, it has been working two 9-hr. turns. Pending the development of a large amount of business now being figured, the company expects to be working at 40 per cent for a few weeks.

The business outlook for 1924-25 is one of the general topics for the annual meeting of the American Association for Labor Legislation to be held in Washington at the New Willard Hotel, Dec. 27, 28 and 29. This topic will be considered on Thursday morning, Dec. 27 and will be a joint session with the American Statistical Association and the American Economic Association.

The Pierce, Butler & Pierce Mfg. Corporation, New York, has acquired control of the Wolff Mfg. Co., Chicago, and will operate it as a unit of its organization in connection with its plumbing goods department. J. T. Duryea, president of the New York company, has been elected president of the Wolff company, succeeding Nels Gross, resigned.

Prices Finished Iron and Steel f.o.b. Pittsburgh

Carload Lots

Plates

Sheared, tank quality, base, per lb.....2.50c.

Structural Materials

Beams, channels, etc., base, per lb.....2.50c.
Sheet piling .....2.65c.

Iron and Steel Bars

Soft steel bars, base, per lb.....2.40c.
Soft steel bars for cold finishing.....$3 per ton over base
Reinforcing steel bars, base.....2.40c.
Refined iron bars, base, per lb.....3.10c. to 3.15c.
Double refined iron bars, base, per lb.....4.75c.
Stay bolt iron bars, base, per lb.....7.75c. to 8c.

Hot-Rolled Flats

Hoops, base, per lb.....3c.
Bands, base, per lb.....3c.
Strips, base, per lb.....2.75c. to 3c.

Cold-Finished Steel

Bars and shafting, base, per lb.....3c.
Bars, S. A. E. Series, No. 2100.....4.75c.
Bars, S. A. E. Series, No. 2300.....6.25c. to 6.50c.
Bars, S. A. E. Series, No. 3100.....5.25c. to 5.50c.
Strips, base, per lb.....4.75c. to 5.00c.

Wire Products

Nails, base, per keg.....$3.00
Galvanized nails, 1 in. and over.....$2.25 over base
Galvanized nails, less than 1 in..... 2.50 over base
Bright plain wire, base, No. 9 gage, per 100 lb.....$2.75
Annealed fence wire, base, per 100 lb..... 2.90
Spring wire, base, per 100 lb..... 3.70
Galvanized wire, No. 9, base, per 100 lb..... 3.35
Galvanized barbed, base, per 100 lb..... 3.80
Galvanized staples, base, per keg..... 3.80
Painted barbed wire, base, per 100 lb..... 3.45
Polished staples, base, per keg..... 3.45
Cement coated nails, base, per count keg..... 2.70
Bale ties, carloads to jobbers.....75 and 2½ per cent off list
Woven fence, carloads (to jobbers).....67½ per cent off list
Woven fence, carloads (to retailers).....65 per cent off list

Bolts and Nuts

Machine bolts, small, rolled threads, 60, 10 and 10 per cent off list
Machine bolts, all sizes, cut threads..60 and 10 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads.60 and 10 per cent off list
Carriage bolts, cut threads, all sizes.....60 per cent off list
Lag bolts .....65 and 10 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads...50 and 10 per cent off list
Other style heads.....20 per cent extra
Machine bolts, c.p.c. and t. nuts, ⅜ x 4 in., 50 and 10 per cent off list
Larger and longer sizes.....50 and 10 per cent off list
Hot pressed square or hex. nuts, blank.....4.50c. off list
Hot pressed nuts, tapped.....4.50c. off list
C.p.c. and t. square or hex. nuts, blank.....4.00c. off list
C.p.c. and t. square or hex. nuts, tapped.....4.00c. off list
Semi-finished hex. nuts:
⅝ in. and smaller, U. S. S.....80 and 5 per cent off list
⅝ in. and larger, U. S. S.....75 and 5 per cent off list
Small sizes, S. A. E.....80, 10 and 5 per cent off list
S. A. E., ⅝ in. and larger.....75, 10 and 5 per cent off list
Stove bolts in packages.....75, 10 and 5 per cent off list
Stove bolts in bulk.....75, 10, 5 and 2½ per cent off list
Tire bolts .....60 and 10 per cent off list
Bolt ends with hot pressed nuts.....60 and 5 per cent off list
Turnbuckles, with ends, ½ in. and smaller, 50 to 55 and 5 per cent off list
Turnbuckles, without ends, ½ in. and smaller, 65 and 5 to 70 and 10 per cent off list
Washers .....5c. to 5.25c. off list

Semi-Finished Castellated and Slotted Nuts

(To jobbers and consumers in large quantities f.o.b. Pittsburgh.)

	Per 1000 S. A. E.	Per 1000 U. S. S.		Per 1000 S. A. E.	Per 1000 U. S. S.
¼-in.	$4.80	$4.80	⅝-in.	$15.00	$15.00
7/16-in.	5.50	6.00	⅝-in.	19.50	20.00
⅜-in.	6.50	7.00	¾-in.	28.50	28.50
9/16-in.	9.00	9.50	⅞-in.	37.00	37.50
½-in.	11.00	11.50	1-in.	58.50	60.50

Larger sizes—Prices on application.

Cap and Set Screws

Milled square and hex. head cap screws.....70 per cent off list
Milled set screws.....70 per cent off list
Upset cap screws.....75 and 10 per cent off list
Upset set screws.....75 and 10 per cent off list
Milled studs .....50 and 10 per cent off list

Rivets

Large structural and ship rivets, base, per 100 lb.....$2.90
Small rivets .....65, 10 and 5 off list

Track Equipment

Spikes, ⅝ in. and larger, base, per 100 lb.....$3.00 to $3.15
Spikes, ½ in., 9/16 in. and ⅝ in., per 100 lb..... 3.15 to 3.25
Spikes, ⅜ in..... 3.15 to 3.25
Spikes, boat and barge, base, per 100 lb..... 3.25 to 3.50
Track bolts, ¾ in and larger, base, per 100 lb.. 4.00 to 4.25
Track bolts, ½ in. and ⅝ in., base, per 100 lb.. 5.00 to 5.50
Tie plates, per 100 lb..... 2.55 to 2.60
Angle bars, base, per 100 lb..... 2.75

Welded Pipe

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛	45	19½	¼ to ⅜	+11	+39
¼ to ⅜	51	25½	½	22	2
½	56	42½	¾	28	11
¾	60	48½	1 to 1½	30	13
1 to 3	62	50½			

Lap Weld

2	55	43½	2	23	7
2½ to 6	59	47½	2½	26	11
7 and 8	56	43½	3 to 6	28	13
9 and 10	54	41½	7 to 12	26	11
11 and 12	53	40½			

Butt Weld, extra strong, plain ends

¼	41	24½	2 to 3	61	50½
⅜ to ⅜	47	30½	¼ to ⅜	+19	+54
½	53	42½	½	21	7
¾	58	47½	¾	28	12
1 to 1½	60	49½	1 to 1½	30	14

Lap Weld, extra strong, plain ends

2	53	42	2	23	9
2½ to 4	57	46½	2½ to 4	29	15
4½ to 6	56	45½	4½ to 6	28	14
7 to 8	52	39½	7 to 8	21	7
9 and 10	45	32½	9 to 12	16	2
11 and 12	44	31½			

To the large jobbing trade the above discounts are increased by one point, with supplementary discounts of 5 per cent on black and 1½ points, with a supplementary discount of 5 per cent on galvanized.

Boiler Tubes

Lap Welded Steel		*Charcoal Iron*	
2 to 2¼ in.	27	1½ in.	+18
2½ to 2¾ in.	37	1¾ to 1⅞ in.	+ 8
3 in.	40	2 to 2¼ in.	— 2
3¼ to 3¾ in.	42½	2½ to 3 in.	— 7
4 to 13 in.	46	3¼ to 4½ in.	— 9

Less carload lots 4 points less.

Standard Commercial Seamless Boiler Tubes

Cold Drawn			
1 in.	55	3 and 3¼ in.	36
1¼ and 1½ in.	47	3½ and 3¾ in.	37
1¾ in.	31	4 in.	41
2 and 2¼ in.	22	4½ in. and 5 in.	33
2½ and 2¾ in.	32		

Hot Rolled			
3 and 3¼ in.	38	4 in.	43
3½ in. and 3¾ in.	39		

Less carloads, 4 points less. Add $8 per net ton for more than four gages heavier than standard. No extras for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be sold at mechanical tube list and discount. Intermediate sizes and gages not listed take price of net larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Carbon under 0.30, base.....83 per cent off list
Carbon 0.30 to 0.40, base.....81 per cent off list
Plus usual differentials and extras for cutting. Warehouse discounts range higher.

Seamless Locomotive and Superheater Tubes

	Cents per Ft.		Cents per Ft.
2-in. O.D. 12 gage	15	2¼-in. O.D. 10 gage	20
2-in. O.D. 11 gage	16	3-in. O.D. 7 gage	35
2-in. O.D. 10 gage	17	1½-in. O.D. 9 gage	15
2¼ in. O.D. 12 gage	17	5½-in. O.D. 9 gage	55
2¼-in. O.D. 11 gage	18	5½-in. O.D. 9 gage	57

Tin Plate

Standard cokes, per base box.....$5.50

Terne Plate

(Per Package, 20 x 28 in.)

8-lb. coating, 100 lb. base	$11.00	20-lb. coating I. C.	$14.90
8-lb. coating I. C.	11.30	25-lb. coating I. C.	16.20
12-lb. coating I. C.	12.70	30-lb. coating I. C.	17.35
15-lb. coating I. C.	13.95	35-lb. coating I. C.	18.35
		40-lb. coating I. C.	19.35

Sheets

Blue Annealed

Nos. 9 and 10 (base), per lb.....2.90c. to 3c.

Box Annealed, One Pass Cold Rolled

No. 28 (base), per lb.....3.75c. to 3.85c.

Automobile Sheets

Regular auto body sheets, base (22 gage), per lb.....5.35c.

Galvanized

No. 28 (base), per lb.....4.90c. to 5c.

Long Ternes

No. 28 gage (base), 8-lb. coating, per lb.....5.30c.

Tin-Mill Black Plate

No. 28 (base), per lb.....3.85c.

Prices of Raw Materials, Semi-Finished and Finished Products

Ores

Lake Superior Ores, Delivered Lower Lake Ports

Old range Bessemer, 55 per cent iron	$6.45
Old range non-Bessemer, 51½ per cent iron	5.70
Mesabi Bessemer, 55 per cent iron	6.20
Mesabi non-Bessemer, 51½ per cent iron	5.55

Foreign Ore, per Unit, c.i.f. Philadelphia or Baltimore

Iron ore, low phos., copper free, 55 to 58 per cent iron in dry Spanish or Algerian	11.00c.
Iron ore, Swedish, average 66 per cent iron	10.50c.
Manganse ore, washed, 51 per cent manganese, from the Caucasus, nominal	41c.
Manganese ore, ordinary, 48 per cent manganese, from the Caucasus	38c.
Manganese ore, Brazilian or Indian, nominal	42c.
Tungsten ore, per unit, in 60 per cent concentrates	$8.25 to $10.00
Chrome ore, basic, 48 per cent Cr_2O_3, crude, per ton, c.i.f. Atlantic seaboard	18.00 to 28.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS_2, New York	75c. to 85c.

Ferroalloys

Ferromanganese, domestic, 80 per cent, furnace, or seaboard, per ton	$107.50 to $110.00
Ferromanganese, British, 80 per cent, f.o.b. Atlantic port, duty paid	110.00
Ferrosilicon, 50 per cent, delivered	75.00
Ferrotungsten, per lb. contained metal	85c. to 90c.
Ferrochromium, 4 to 6 per cent carbon, 60 to 70 per cent Cr. per lb. contained Cr. delivered	12c.
Ferrochromium, 6 to 7 per cent carbon, 60 to 70 per cent Cr., per lb.	11.50c.
Ferrovanadium, per lb. contained vanadium	$3.50 to $4.00
Ferrocarbontitanium, 15 to 18 per cent, per net ton	200.00

Spiegeleisen, Bessemer Ferrosilicon and Silvery Iron

(Per gross ton furnace unless otherwise stated)

Spiegeleisen, domestic, 19 to 21 per cent	$40.00
Spiegeleisen, domestic, 16 to 19 per cent	39.00

Ferrosilicon, Bessemer, 10 per cent, $41.50; 11 per cent, $44; 12 per cent, $46.50.

Silvery iron, 6 per cent, $30.00; 7 per cent, $31.00; 8 per cent, $32.50; 9 per cent, $34.50; 10 per cent, $36.50; 11 per cent, $39.00; 12 per cent, $41.50.

Fluxes and Refractories

Fluorspar, 80 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines	$22.00
Fluorspar, 85 per cent and over calcium fluoride, not over 5 per cent silica, per net ton f.o.b. Illinois and Kentucky mines	23.50

Per 1000 f.o.b. works:

Fire Clay:	High Duty	Moderate Duty
Pennsylvania	$42.00 to $45.00	$37.00 to $42.00
Maryland	47.00	42.00
Ohio	42.00 to 43.00	37.00 to 39.00
Kentucky	42.00 to 43.00	37.00 to 39.00
Illinois	——	37.00 to 42.00
Missouri	42.00 to 45.00	35.00 to 40.00
Ground fire clay, per net ton		6.00 to 7.00

Silica Brick:	
Pennsylvania	42.00
Chicago	49.00
Birmingham	50.00
Ground silica clay, per net ton	8.00
Magnesite Brick:	
Standard size, per net ton (f.o.b. Baltimore and Chester, Pa.)	65.00
Grain magnesite, per net ton (f.o.b. Baltimore and Chester, Pa.)	40.00
Chrome Brick:	
Standard size, per net ton	48.00

Semi-Finished Steel, F.O.B. Pittsburgh or Youngstown, per gross ton

Rolling billets, 4-in. and over	$40.00
Rolling billets, 2-in. and under	40.00
Forging billets, ordinary carbons	45.00
Sheet bars, Bessemer	42.50
Sheet bars, open-hearth	42.50
Slabs	40.00
Wire rods, common soft, base, No. 5 to ¼-in.	51.00
Wire rods, common soft, coarser than ¼-in.	$2.50 over base
Wire rods, screw stock	$5.00 per ton over base
Wire rods, carbon 0.20 to 0.40	3.00 per ton over base
Wire rods, carbon 0.41 to 0.55	5.00 per ton over base
Wire rods, carbon 0.56 to 0.75	7.50 per ton over base
Wire rods, carbon over 0.75	10.00 per ton over base
Wire rods, acid	15.00 per ton over base
Skelp, grooved, per lb.	2.35c. to 2.40c.
Skelp, sheared, per lb.	2.35c. to 2.40c.
Skelp, universal, per lb.	2.35c. to 2.40c.

Finished Iron and Steel, F.O.B. Mill

Rails, heavy, per gross ton	$43.00
Rails, light, new steel, base, lb.	2.25c.
Rails, light, rerolled, base, per lb.	1.85c. to 2.00c.
Spikes, ⅝-in. and larger, base, per 100 lb.	$3.00 to $3.15
Spikes, ½-in. and smaller, base, per 100 lb.	3.15 to 3.25
Spikes, boat and barge, base, per 100 lb.	3.25 to 3.50
Track bolts, ⅝-in. and smaller, base, per 100 lb.	4.00 to 4.25
Track bolts, ¾-in. and larger, base, per 100 lb.	4.50 to 5.00
Tie plates, per 100 lb.	2.55 to 2.60
Angle bars, per 100 lb.	2.75
Bars, common iron, base, per lb., Chicago mill	2.40c.
Bars, common iron, Pittsburgh mill	2.40c.
Bars, rails, steel reinforcing, base, per lb.	2.15c. to 2.25c.
Ground shafting, base, per lb.	3.40c.
Cut nails, base, per keg	$3.15 to $3.25

Alloy Steel

S.A.E. Series Numbers	Bars 100 lb.
2100*(½% Nickel, 10 to 20 per cent Carbon)	$3.50
2300 (3½% Nickel)	5.00 to 5.25
2500 (5% Nickel)	7.75 to 8.00
3100 (Nickel Chromium)	4.00 to 4.25
3200 (Nickel Chromium)	5.75 to 6.00
3300 (Nickel Chromium)	8.00 to 8.25
3400 (Nickel Chromium)	7.00 to 7.25
5100 (Chromium Steel)	3.75
5200*(Chromium Steel)	7.50 to 8.00
6100 (Chromium Vanadium bars)	4.75 to 5.00
6100 (Chromium Vanadium spring steel)	4.50 to 4.75
9250 (Silico Manganese spring steel)	3.75 to 4.00
Nickel Chrome Vanadium (0.60 Nickel, 0.50 Chromium, 0.15 Vanadium)	5.00 to 5.25
Chromium Molybdenum bars (0.80—1.10 Chromium, 0.25—0.40 Molybdenum)	4.50 to 4.75
Chromium Molybdenum bars (0.50—0.70 Chromium, 0.15—0.25 Molybdenum)	4.25 to 4.50
Chromium Molybdenum spring steel (1—1.25 Chromium, 0.30—0.50 Molybdenum)	4.75 to 5.00

Above prices are for hot-rolled alloy steel bars, forging quality, per 100 lb., f.o.b. Pittsburgh. Billets 4 x 4 in. and larger are $10 per gross ton less than net ton price for bars of same analyses. On smaller than 4 x 4-in. billets the net ton bar price applies.

*Not S.A.E. specifications, but numbered by manufacturers to conform to S.A.E. system.

Freight Rates

All rail freight rates from Pittsburgh on finished iron and steel products, carload lots, 36,000 lb. minimum carload, per 100 lb.:

Philadelphia, domestic	$0.32	Buffalo	$0.265	St. Louis	$0.43	*Pacific Coast	$1.15
Philadelphia, export	0.235	Cleveland	0.215	Kansas City	0.735	*Pac. Coast, ship plates	1.20
Baltimore, domestic	0.31	Cleveland, Youngstown		Kansas City (pipe)	0.705	Birmingham	0.58
Baltimore, export	0.225	Comb.	0.19	St. Paul	0.60	Memphis	0.56
New York, domestic	0.34	Detroit	0.29	Omaha	0.735	Jacksonville, all rail	0.70
New York, export	0.255	Cincinnati	0.29	Omaha (pipe)	0.705	Jacksonville, rail and water	0.415
Boston, domestic	0.365	Indianapolis	0.31	Denver	1.26	New Orleans	0.67
Boston, export	0.255	Chicago	0.34	†Denver (pipe)	1.17		

*Applies minimum carload 80,000 lb. †Minimum loading 46,000 lb.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 35c.; ship plates, 40c.; ingot and muck bars, structural steel, common wire products including cut or wire nails, spikes, and wire hoops, 40c.; sheets and tin plates, 40c.; sheets, No. 12 gage and lighter, 50c.; rods, 40c.; wire rope cables and strands, 45c.; wire fencing, netting and stretcher, 40c.; pipes not over 12 in. in diameter, 55c.; over 12 in. in diameter, 2½c. per in. or fraction thereof additional. All rates per 100 lb. in carload lots, minimum 36,000 lb.

CLAIRE FURNACE CASE

Supreme Court Will Decide Whether Information Must Be Given

WASHINGTON, Dec. 11.—Following completion of arguments, the Supreme Court of the United States has taken under advisement the case of the Claire Furnace Co. and other iron and steel producers against the Federal Trade Commission. The proceeding involves the authority of the commission to compel the filing by iron and steel makers of production, cost and sales reports covering materials produced for sale in interstate commerce.

Paul D. Cravath, appearing for the iron and steel manufacturers, argued that Congress has no power to inquire into the business of any of the appellees and that it has no authority to delegate the commission to do so except in respect of a reasonably suspected violation of Federal law. He said also that the sale of finished products and the purchase of raw materials are entirely separate from the manufacture or mining, and proper information in respect of sales or purchases can be secured separately. The commission, he declared, has no authority to require information as to intrastate sales.

Solicitor General Beck of the Department of Justice repeated the Government's contention that Congress can constitutionally authorize an administrative body to collect information regarding any subject over which it has legislative jurisdiction.

Coke Oven Gas for Cast Iron Pipe Plants in Alabama

BIRMINGHAM, ALA., Dec. 10.—Within a few weeks, all of the pressure pipe plants in the Birmingham city limits and suburbs will be using by-product coke oven gas as fuel, eliminating to a considerable extent coke. The Industrial Gas Corporation, a subsidiary of the Alabama By-Products Corporation, of which Morris Bush is executive, has laid mains from the by-product coke oven plant at Tarrant City to North Birmingham and Acipco, where the United States Cast Iron Pipe & Foundry Co., the American Cast Iron Pipe Co., the American Radiator Co., and others can get a bountiful supply of the by-product gas. The National Cast Iron Pipe Co. and the Vulcan Rivet Co., located at Tarrant City, have been getting this gas for some time.

Meeting of Engineers Well Attended

A good attendance marked the forty-fourth annual meeting of the American Society of Mechanical Engineers, held at the Engineering Societies Building, New York, Dec. 3 to 6. Although the number registered was not more than 2000, the actual attendance was estimated to be much greater.

Eighteen technical sessions were held at which 46 papers were read and discussed and there were more than 30 committee meetings. Social activities were a feature as heretofore, and an extensive program was provided for the ladies. Plants inspected included the American Machine & Foundry Co., Brooklyn, N. Y., at which the manufacture of automatic machines for the tobacco trade was seen, the plant being considered an excellent example of a factory building automatic machinery. A visit was made to the plant of the E. W. Bliss Co., Brooklyn, N. Y., to the Wright Aeronautical Corporation, Paterson, N. J., and to the Durant Motor Co., Star automobile factory, North Elizabeth, N. J. Reports of the machine shop, management and other sessions will be given in this and later issues.

The officers, whose nominations were given some months ago in these columns, are as follows: President, F. R. Low, editor *Power*. The new vice-presidents: George I. Rockwood, vice-president Rockwood Sprinkler Co., Worcester; Will J. Sando, consulting engineer, Milwaukee, and H. Birchard Taylor, vice-president William Cramp & Sons Ship & Engine Building Co., Philadelphia. Frank A. Scott, president Warner & Swasey Co., Cleveland; E. R. Fish, vice-president Heine Boiler Co., St. Louis; and Everett O. Eastwood, University of Washington, Seattle, will serve as managers.

The spring meeting will be held May 19 to 22 in Cleveland.

Mill Operations Reduced in the Mahoning Valley

YOUNGSTOWN, Dec. 11.—Mill operations in the Mahoning Valley this week continue to reflect the hand-to-mouth buying prevalent at this season of the year. Rolling mill operations average less than the week before, while plate mill production is entirely suspended.

Sheet mill schedules decline, with 68 of 120 sheet and jobbing mills scheduled Monday, comparing with 76 scheduled the week before. The Falcon Steel Co. has put four of its eight sheet mills at Niles on the inactive list, while the Sharon Steel Hoop Co. has likewise reduced the number of its active sheet units from nine to five.

Independent tin mill operations show a decline of six mills, as compared with the week before. Two fewer units are operating at the plant of the Trumbull Steel Co., while the Falcon Tin Plate Co. has taken four mills off the active list of its Canton property.

Puddling operations continue at a high rate, with all of the puddling furnaces at the Girard plant of the A. M. Byers Co. active, and the 44 puddle units of the Sheet & Tube company close to normal.

Open hearth capacity is being operated on the basis of 32 active units of 51 in the Valley. Sheet and tin plate production of the Steel Corporation subsidiaries in the Youngstown district continues at a rate close to normal.

Building Trades Wages in New York

Building trades unionists in New York will receive the same wage scale and bonus throughout 1924 as is paid this year, according to the decision reached Dec. 7 by the Building Trades Employers' Association. A short time ago, the old Building Trades Council requested that $1 per day be added to the 1923 scale, thereby increasing cost to owners and contractors $10,000,000 to $25,000,000. The decision of the employers is due in part to the report of the United States Bureau of Labor in September, which showed that the cost of living was 75.4 per cent above 1914. It was also pointed out that in no case was the increase in wages of trades below that figure, while in many cases wage increases were double the figure. There is slight prospect of a strike over any differences which may ensue.

Testing Society's Annual Meeting

The 1924 annual meeting of the American Society for Testing Materials will be held at the Chalfonte-Haddon Hall, Atlantic City, N. J., Monday, June 23, to Friday, June 27, or Saturday, June 28.

The executive committee has considered the possible advantages of beginning the annual meeting on Thursday, June 19, immediately following the adjournment of the meeting of the American Railway Association. The advantages that would accrue to a comparatively few members of the society are offset by the disadvantages incident to having our meeting extending over the week-end period. It is therefore considered advisable to meet as heretofore during the last full week in June.

Steel Treaters' Winter Sectional Meeting

The winter sectional meeting of the American Society for Steel Treating will be held at the Hotel Seneca, Rochester, N. Y., Jan. 31 and Feb. 1, 1924.

NON-FERROUS METALS

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Straits Tin	Lead		Zinc	
Dec.	Lake	Electrolytic*	New York	New York	St. Louis	New York	St. Louis
5.....	13.25	12.87½	47.45	7.30	7.00	6.65	6.30
6.....	13.25	12.87½	47.87½	7.40	7.10	6.60	6.25
7.....	13.25	12.87½	47.50	7.50	7.25	6.60	6.25
8.....	13.25	12.87½	....	7.50	7.25	6.60	6.25
10.....	13.25	12.87½	46.12½	7.50	7.25	6.60	6.25
11.....	13.25	12.87½	46.50	7.62½	7.37½	6.60	6.25

*Refinery quotation; delivered price ¼c. higher.

New York

NEW YORK, Dec. 11.

All the markets are quiet except lead which has advanced sharply with demand strong. A fair business is being done in copper at steady prices. The tin market has been moderately active and prices have fallen. The zinc market is quiet and a little lower.

Copper.—For the first time this year, when demand has been light or only fair, copper prices have remained practically stationary instead of falling. For over two weeks electrolytic copper has remained at 13.12½c., delivered, as the minimum price. One explanation for this firmness is that in November deliveries into consumption were larger than in October and production was smaller, resulting in a decrease in stocks. These facts have been the basis for a more confident tone. The present market is essentially one measured by demand for the first quarter and such business is considered fairly good, both from domestic and foreign sources. Electrolytic copper today is quoted at 13.12½c. to 13.25c., delivered, for first quarter, with some December metal pressing on the market at 13.12½c. Lake copper is quoted at 13.25c., delivered.

Tin.—The feature of the week in Straits tin was the break yesterday in the London market of about £8 per ton, ascribed by some to selling of the metal at Singapore. Some here are of the opinion that the slump was due to the election in England. At any rate, the effect was a decided decline in the New York market, with futures selling under 46c. and prompt around 46.12½c. On this decline consumers bought liberally yesterday with total sales amounting to at least 500 tons, two leading importers being the sellers. The latter part of last week the market was quiet but there were fair sales, consumers buying rather heavily the latter part of the week. This activity was ascribed by some to the covering of short sales. Today the market has been moderately active with spot Straits tin quoted today at 46.50c., New York. London prices today were £229 10s. for spot standard, £230 15s. for future standard and £231 10s. for spot Straits, all about £7 per ton less than a week ago.

Lead.—The lead market is very strong with prices rising rapidly. This condition is due to a good demand and a lack of offerings, with most producers sold up. The sending of Mexican lead to Europe, instead of importing it here, is also mentioned as another cause. On Dec. 5 the leading producer advanced its price to 7.25c., New York, and the outside market has continued to advance since. The actual market quotation is difficult to determine, reports of sellers being to the effect that sales have been made in St. Louis yesterday and today at a range of 7.25c. to 7.50c. and in New York at a range of 7.50c. to 7.75c.

Zinc.—There is a moderate demand for prime Western and producers have evidently sold enough so as not to press the metal on the market and dealers and operators are apparently inactive. Prices are slightly lower than a week ago with 6.25c., St. Louis, or 6.60c., New York, quoted for nearby, with 6.30c., St. Louis, and 6.65c., New York, the premium on futures.

Nickel.—Quotations for shot and ingot nickel are unchanged at 29c. to 32c. per lb., with electrolytic nickel held at 32c. by the leading producers. Both shot and ingot nickel in the outside market are quoted at 29c. to 32c. per lb.

Antimony.—The market is easier and quiet with wholesale lots of Chinese metal for early delivery quoted at 8.60c. to 8.70c., New York, duty paid.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted by importers at 26c. to 26.50c., delivered, duty paid, with some sellers unable to obtain the metal from foreign producers. Quotations of American producers are not made public.

Old Metals.—The tone of the market is improved and values are a little higher. Dealers' selling prices are as follows:

	Cents per Lb.
Copper, heavy and crucible	12.75
Copper, heavy and wire	11.75
Copper, light and bottoms	10.00
Heavy machine composition	10.75
Brass, heavy	8.00
Brass, light	6.25
No. 1 red brass or composition turnings	9.00
No. 1 yellow rod brass turnings	7.00
Lead, heavy	6.75
Lead, tea	5.75
Zinc	5.00
Cast aluminum	17.50
Sheet aluminum	17.50

Chicago

CHICAGO, Dec. 11.—Lead has advanced sharply on a revival of demand, with supplies of the metal restricted. The price situation is very strong. Tin has receded from the high point reached the latter part of last week. There is evidently plenty of tin available for sale, although the metal is closely held. Copper is slightly stronger, while zinc is quiet and has declined. Antimony is more freely offered, although prices remain unchanged. Among the old metals certain grades of copper, brass and lead have advanced. We quote in carload lots: Lake copper, 13.50c.; tin, 48c.; lead, 7.30c.; spelter, 6.30c.; antimony, 11c., in less than carload lots. On old metals we quote copper wire crucible shapes and copper clips, 10.50c.; copper bottoms, 9.50c.; red brass, 8.75c.; yellow brass, 6.75c.; lead pipe, 5.75c.; zinc, 4.25c.; pewter, No. 1, 25c.; tin foil, 32c.; block tin, 36c.; all buying prices for less than carload lots.

Present Status of Pressed Metal Industry

(*Concluded from page* 1580)

It was stated that generally speaking, most inquiries are received from prospects without personal solicitation, which would indicate, perhaps, that there is a general quest for possible improvements in various industries, as if it were a vague premonition of benefits to be obtained from this young industry. "It is in the fulfillment of this vague and widespread premonition," said Mr. Cook, "that the industry is to render its greatest service to industry at large, making broadly available its large store of useful knowledge, its facilities and the highly specialized skill accumulated. To accomplish this it must do its work through a hitherto almost unrecognized agent, the pressed metal engineer."

Of this coming type of pressed metal sales engineer and his specific work a few general suggestions were given, and it was said that the reception usually accorded the competent sales engineer is cordial, especially if equipped with samples of interesting work. The qualities of such an engineer were outlined and some helpful methods given. Rough free hand sketches were said to be useful in interviewing prospects. When a design had been decided upon, a simple distinct drawing or isometric sketch of the proposed redevelopment was stated to be of great assistance, and if properly utilized in the actual "selling," it is often sufficient to close the contract. It has, he said, an attraction far beyond that of the cold mechanical drawing or blueprint. The actual hand model was said to present the strongest appeal, which theoretical advantages became not only visible, but tangible and existent. The paper was followed by lantern slides showing numerous examples of redesign into pressed metal of single parts, simple assemblies and complete redevelopment of assembled devices. The illustrations were selected to present the matter from the viewpoint of the sales engineer rather than from the production expert.

PERSONAL

Frank Garratt, for the past eight years identified with industrial interests in Latrobe, Pa., has resigned as general superintendent of the Latrobe Electric Steel Co. For several years he was also general manager of the Hudson Reduction Co., manufacturer of metallic tungsten and ferrotungsten.

Gerald T. Haddock, formerly connected with the Roderick & Bascom Rope Co., St. Louis, has been appointed sales engineer for the Bayonne plant of the International Nickel Co.

Hollis T. Waldo has resigned his position with the Goulds Mfg. Co., and has opened an office as hydraulic engineer in Haverhill, Mass. He will also act as representative for the Goulds company in northern Massachusetts and southern New Hampshire.

Thomas H. Thorn has been appointed district manager of the Terminal Engineering Co., New York, with offices in Pittsburgh.

H. P. Duval has been appointed sales representative of H. D. Conkey & Co., Mendota, Ill., manufacturer of hand power and electric cranes and industrial cars, with headquarters in Kansas City, Mo. S. A. Gilliard has been appointed sales agent with headquarters at 405 Liberty Building, Buffalo.

George G. Hamilton, has resigned his position with the National Engine Hoisting Co. to become secretary-treasurer of the newly organized H. & O. Machinery & Engineering Co., Newark, N. J.

Carl G. Barth, consulting engineer, will leave soon for Japan as technical expert for the Tinius Olsen Testing Machine Co., Philadelphia, to be gone possibly for three years.

Ledlie I. Laughlin, member of the directorate, Jones & Laughlin Steel Corporation, has been appointed district sales manager at Buffalo to succeed C. S. Bradley, who was recently transferred to Pittsburgh and made manager of hot-rolled sales. Mr. Laughlin is a son of James B. Laughlin, former treasurer of the Jones & Laughlin Steel Co., and is a graduate of Princeton University, class of 1912. During the war he served overseas as captain of the 315th Infantry, 79th Division. Mr. Laughlin has recently been attached to the New York office. He will take charge of the Buffalo office about the middle of this month.

Charles W. Dunlap, vice-president Waukesha Steel Products Co., Waukesha, Wis., has moved to Atlanta, Ga., to engage in sales engineering activities.

A. M. Hirsch, formerly connected with the Vanadium Alloys Steel Co., and Le Moyne Steel Co., has been appointed manager of the Cincinnati branch office of the Ziv Steel & Wire Co., Chicago.

Hayden Ames, Cleveland, has been appointed general manager of the Haynes Automobile Co., Kokomo, Ind. S. E. Burke, Detroit, has been appointed sales manager.

F. A. J. Fitzgerald of the Fitzgerald Laboratories, Niagara Falls, N. Y., sails this week for Europe. He will visit Belfast and Dublin, Ireland, returning about the first week in February.

Edwin H. Steedman, president, Curtis & Co. Mfg. Co., St. Louis, and Mrs. Steedman, who have been in British East Africa for the last three months hunting big game, arrived in New York on Dec. 8, on the French liner, Paris, from Havre. They proceeded at once to their home in St. Louis.

William H. Blauvelt, consulting engineer, New York, will address a meeting of the metropolitan section of the American Society of Mechanical Engineers on Tuesday evening, Dec. 18, at the Engineering Societies Building, New York, on the processes of high and low temperature distillation of coal.

George E. Vanhagen, president Standard Forgings Co., Chicago, suffered a dislocated hip in the Twentieth Century wreck at Forsyth, N. Y., early Sunday morning, Dec. 9.

Obituary

ANTONIO C. PESSANO, prominent shipbuilder and engineer, and chairman of the board of directors of the Great Lakes Engineering Works, Detroit and Ashtabula, Ohio, died on Dec 5, at the Hotel Plaza, New York, where he had made his home for several years. He was born in Philadelphia, July 3, 1857, and received his early education in the Philadelphia High School and Franklin Institute of Technology. Mr. Pessano was called to Detroit in 1902 by a group of local capitalists who acquired the old S. F. Hodge Riverside Iron Works. With this plant as a nucleus, the Great Lakes Engineering Works was organized, Mr. Pessano becoming president and general manager. Shipyards were established at Ecorse, below St. Clair, and within a few years at Ashtabula. From these plants have been turned out many large craft, including some of the most modern steel freighters in the service on the Great Lakes. More than 100 ships for salt water service were built, including a fleet of steel ships for the United States Shipping Board during the war. The vigorous personality of Mr. Pessano contributed largely to this success. Confidence in his company, in the future of Detroit and America, was one of Mr. Pessano's strong characteristics. In 1920 the Great Lakes Engineering Works was liquidated and its properties were purchased by a new company of the same name, which Mr. Pessano formed from some of the interests which had been connected with the old company. He was made chairman of the board at that time. During his residence in Detroit, he was a member of the Detroit Engineering Society, American Society of Mechanical Engineers, National Association of Manufacturers, National Founders' Association, National Metal Trades Association, Employers' Association of Detroit and the Detroit Board of Commerce.

BENJAMIN FRANKLIN FOX, president Benjamin F. Fox & Sons, Inc., iron founders, 509 West Thirty-fourth Street, New York, died Dec. 9, at St. Luke's Hospital, that city, aged 57 years. He was for 12 years a member of the Republican State Committee. The foundry of which he was head was established by his father, a native of Yorkshire, and is one of the oldest in the city.

WILLIAM DE MOOY, a pioneer foundryman of Cleveland, died at his winter home in St. Petersburg, Fla., Dec. 5, age 83 years. He was employed for some time as foreman by the Taylor & Boggis Foundry Co., Cleveland, and in 1882 became a partner in the Palmer & De Mooy Foundry, later acquired by an incorporated company of which Mr. De Mooy was president for 12 years following the death of Mr. Palmer. After having been associated with this foundry nearly 40 years, he retired four years ago, when the plant was merged with the Acme Foundry Co., the name being changed to the Acme-Palmer & De Mooy Foundry Co.

JULIUS C. BIRGE, vice-president Ames Shovel & Tool Co., St. Louis, died at his home in that city on the evening of Dec. 8, after a month's illness of kidney trouble. He was born at Whitewater, Wis., in 1839, the first white child born in Walworth County. He spent several years in the far West as a young man, and wrote a book, "The Awakening of the Desert," in which he told of his experiences. He went to St. Louis in 1866, and established the St. Louis Shovel Co., which became the Ames Shovel & Tool Co. in 1902.

WILLIAM H. COOLEY, treasurer New York Car Wheel Co., Buffalo, died at his home, 64 Norwood Avenue, on Dec. 7, aged 53 years. He was born in South Deerfield, Mass., and in 1902 he became associated with his brother, Frederick B. Cooley, in the Aluminum Castings Co., Buffalo. Three years later the main office was moved to Cleveland and for ten years Mr. Cooley lived there. In 1915 he was appointed to the position he held at the time of his death.

Machinery Markets and News of the Works

YEAR-END BUSINESS QUIET

Machine Tool Sales This Month Are Scattered and Mostly Single Items

A Good Deal of Inquiry Pending, but Action Is Being Deferred Until After Jan. 1

Although machine-tool sellers are putting forth extra efforts to swell their 1923 business as much as possible, there is a good deal of resistance among prospective buyers, even where there is admittedly a need for the tools, to taking any action until after the first of the year. Sales so far this month are scattered and mostly in single-tool lots.

A little railroad buying is reported, orders having been placed by the Chicago, Milwaukee & St. Paul and the Lehigh Valley roads on inquiries of long standing. The New York, New Haven & Hartford has bought a 48-in. car-wheel borer and the Western Fruit Express has bought an axle lathe. The Union Pacific has inquired for a number of machines for its shops at Los Angeles.

A fresh spurt of railroad buying is expected early in the new year, for it is known that a number of roads are preparing lists which will probably be sent out for prices soon. Buying by the automobile companies, which has been a conspicuous feature of machine-tool business throughout the year, has slackened somewhat, but further activity is expected as soon as the plans of automobile makers for 1924 are further along.

The Pettibone-Mulliken Co., Chicago, manufacturer of frogs and switches, has bought four radial drills, three universal tool grinders, three shapers and eight engine lathes. A Chicago district automobile manufacturer has purchased several tools. The Standard Sanitary Mfg. Co., Pittsburgh, is tabulating bids recently received on a list of about 30 tools for its new Baltimore plant.

New York

NEW YORK, Dec. 11.

THE Lehigh Valley Railroad has placed orders for a number of machines, among them a locomotive rod milling machine, a 60-in. vertical milling machine and a 19-in. engine lathe. The inquiry for these tools had been pending since last June. The New York, New Haven & Hartford Railroad has ordered a 48-in. car-wheel borer and the Western Fruit Express has ordered an axle lathe. The Hallidie Machinery Co., a Pacific Coast distributer, has placed an order for an 800-lb. steam hammer with an Eastern company. Aside from these few orders the local machine-tool market is very quiet. Prospective buyers are postponing action in most instances until after the first of the year.

Plans have been filed by the Department of Plant and Structures, Municipal Building, New York, for a ten-story machine and repair works, 173 x 345 ft., at 278-90 Avenue C, estimated to cost $3,500,000, including machinery.

Bids will be asked early in January by Harry Cahn and Philip Wattenberg, 406 East 149th Street, New York, for a two-story automobile service and repair building, 100 x 175 ft., at Sixty-ninth Street and Avenue A, to cost about $300,000 with equipment. John De Hart, 1041 Fox Street, is architect.

The Saratoga County Paper Co., Inc., Ballston Spa, N. Y., has inquiries out for a motor, with rails, pulley and auxiliary equipment. F. J. Talbot is treasurer.

The Fox Foundry Works, F. Fox, president, New York, care of the Manida Building & Construction Co., Inc., Manida Street, has purchased property, 50 x 100 ft., in the Hunts Point section as a site for a six-story foundry for which plans will be drawn at once. Negotiations are also in progress for the acquisition of additional land.

J. Gerard, care of Nicholas Catania, 350 Broadway, New York, is having plans drawn for a four-story automobile service and repair building, 94 x 100 ft., at 136 East Twenty-fifth Street, to cost $250,000 with equipment. H. H. Murdock, 50 East Forty-second Street, is architect.

The Albany Hardware & Iron Co., Albany, N. Y., is planning for a new seven-story works and distributing plant on Broadway, 120 x 200 ft., to cost approximately $500,000 with equipment.

The Electric Bond & Share Co., 71 Broadway, New York, managing and operating electric properties, has purchased the plant and system of the Camaguey Electric Co., Havana, Cuba, for $3,000,000. Plans are under way for extensions and the installation of additional equipment.

Electric and steam power equipment and other machinery will be installed in the two-story refuse destructor for the Department of Works, city of New York, Municipal Building, to be located at Woodhaven, L. I., for which foundations will be laid at once. It will be 60 x 106 ft., estimated to cost $290,000. Joseph P. Powers, Rockaway Beach, L. I., is architect.

N. Coleman, Inc., 33 East Twelfth Street, New York, manufacturer of metal specialties, is taking bids for a new six-story works and distributing plant, 53 x 83 ft., at Hubert and Green Streets, estimated to cost $68,000. George Keister, 56 West Forty-fifth Street, is architect.

The Hawaiian Electric Co., Ltd., Honolulu, has arranged an appropriation of $1,250,000 for extensions and improvements in its power plant and system. A 12,500-kw. steam turbo-generator, two 850-hp. boilers and auxiliary equipment will be installed to increase the capacity to 35,000 kw. A new high-power substation will be constructed at Waikiki. Extensions will be made in the power distributing system at Honolulu to cost $150,000.

The Columbia Machine Works, 269 Chestnut Street, Brooklyn, has filed plans for a one-story addition at 3281-93 Atlantic Avenue. Louis Allmendinger, 20 Palmetto Street, is architect.

Charles N. Whinston & Brothers, 2 Columbus Circle, New York, architects, will prepare plans for a six-story and basement automobile service, machine and repair building, 75 x 90 ft., at 195-99 Washington Street, to cost $300,000, for a company whose name will be announced later.

The Sinclair Crude Oil Producing Co., a subsidiary of the Sinclair Consolidated Oil Corporation, 45 Nassau Street, New York, contemplates extensions in its storage and distributing plant at Glenrock, Wyo., estimated to cost $500,000.

The Electric Equipment Division, Bureau of Foreign and Domestic Commerce, Washington, has information regarding a city in the State of Rio Grande do Sul, Brazil, which plans the construction of a municipal electric power house using American equipment, file No. 112053.

The New York Steel Exchange, Inc., Woolworth Building, New York, has inquiries out for a 25-ton locomotive for export, suitable for quarry work, to operate on a 66-in. gage track.

Officials of the International Combustion Engineering Corporation, 43 Broad Street, New York, and Vickers, Ltd., Leeds and Manchester, England, have formed the Vickers & International Combustion Engineering, Ltd., with capital of £500,000, to operate a plant at Barrow, Furness, England, for the manufacture of power-plant equipment, including special boilers for pulverized fuel, superheaters, economizers,

etc. Sir Trevor Dawson, managing director, Vickers, Ltd., will be chairman of the new company; George E. Learnard and Wilfred R. Wood, president and vice-president of the International Combustion Company, will be active officials.

The New York Auto Body Works, 207 Church Street, Poughkeepsie, N. Y., is having plans drawn for a one-story structure, 50 x 133 ft., for the manufacture of commercial automobile bodies, to cost $20,000 exclusive of equipment. L. L. Booth, 20 Cannon Street, is architect.

The Turl Engineering Works, 39 Cortlandt Street, New York, plan for the installation of steel tanks and other equipment at plant at Peekskill, N. Y.

The Bureau of Foreign and Domestic Commerce, Washington, has information regarding a proposed sugar mill to be erected by a company in Brazil, estimated to cost $200,000, planning to use American machinery. Reference No. 113214.

The Standard Electric Novelty Co., 324 Lafayette Street, New York, manufacturer of electrical specialties, will take over four floors in the building at 19 Bond Street for a new plant.

The Centrifugal Pipe Corporation, recently formed under Delaware laws, will take over and expand the Centrifugal Cast Iron Pipe Co., 15 Exchange Place, Jersey City, N. J.

The Union County Park Commission, 286 East Broad Street, Elizabeth, N. J., will commence the erection of a two and two and one-half story L-shaped machine works for county automobiles and road machinery, 30 x 150 ft. and 30 x 118 ft., on Rahway Avenue. C. Godfrey Poggi, 275 Morris Avenue, is architect.

Fire, Dec. 6, destroyed a portion of the foundry of the A. & F. Brown Co., Elizabethport, N. J., manufacturer of shafting, pulleys, etc., Third Street and Clark Place, with loss estimated at $25,000. It is planned to rebuild.

The Common Council, Maple Shade, N. J., plans the installation of four triplex pumps and auxiliary equipment at its proposed waterworks. Remington & Vosbury, Courthouse Square Building, Camden, N. J., are architects and engineers.

Plans have been filed by the Weiner Auto Body Co., 516 Passaic Avenue, Newark, for a one-story plant, 50 x 140 ft., Hillside, to cost $27,000.

The Beisel Spring Wheel Corporation, 49 West Sixty-fourth Street, New York, recently organized to manufacture wheels, is now in position to receive bids for manufacturing various parts of its product. All work is to be done by contract. J. R. Beisel heads the company.

Manual training equipment will be installed in the new high school to be erected on North Avenue, New Rochelle, N. Y., estimated to cost $1,000,000, for which Guilbert & Betelle, Chamber of Commerce Building, Newark, architects, have been engaged to prepare plans.

The Coplay Cement Mfg. Co., Coplay, Pa., will make extensions in its Mill C, and install new kilns, power equipment and auxiliary machinery.

The Hard Vein Slate Co., Easton National Bank Building, Easton, Pa., recently organized, has acquired property in the vicinity of the former plant of the Northampton Hard Vein Slate Co., which it has succeeded, and will install quarrying and other machinery. William Tonkin is president, and Richard S. Whitesell, treasurer and general manager.

The Lancaster Iron Works, Inc., Lancaster, Pa., is planning for the installation of an open-side planer, 48 x 48 in., about 12 ft. long.

The Watts Water & Power Co. and the Juniata Water & Power Co., Juniata, Pa., are planning for the construction of a hydroelectric power plant on the Juniata River, near Losh's Run.

An ice and refrigerating plant, with power house, will be constructed by the Penn Cress Ice Cream Co., Front Street, Cresson, Pa., in connection with a new three-story factory to cost $150,000 including equipment. A. B. McCullough, 3225 Fifth Avenue, Altoona, Pa., is manager.

The Suffolk Anthracite Collieries Co., Archbald, Pa., has acquired the plant and properties of the Archbald Coal Co., and plans the installation of additional equipment.

The Pennsylvania Railroad Co., Broad Street Station, Philadelphia, will build a new ice-manufacturing and carlcing plant at Huntingdon, Pa., with daily capacity of 225 tons. An ice-storage plant will also be erected. The total cost will amount to about $900,000, including machinery, and will be ready for service early in the spring.

The National Radiator Co., New Castle, Pa., is planning to rebuild its foundry, partially destroyed by fire Dec. 7.

James A. Redington, 9 Spring Street, Pittston, Pa., is having plans prepared for a two-story automobile service and repair building, 60 x 100 ft., estimated to cost $70,000 with equipment.

The Pennsylvania Power & Light Co., Allentown, Pa., will commence the construction of a power house near Green Ridge, Pa., estimated to cost $200,000 with machinery and transmission lines.

The Muncy Valley Light Co., Eaglesmere, Pa., has been organized to install and operate a local plant and system. R. D. Kehrer, Eaglesmere, is treasurer.

The National Self-Carbonating Fountain Co., Bourse Building, Philadelphia, recently organized with capital stock of $300,000 under Delaware laws, will manufacture fountain equipment. Parts will be made by contract, and the company is looking for a manufacturer equipped for this line of work. R. I. Johns is one of the principals.

Philadelphia

PHILADELPHIA, Dec. 10.

CONTRACT has been let by the Electric Development & Machine Co., 221 North Twenty-third Street, Philadelphia, to Franklin M. Harris & Co., 1520 Parrish Street, for a new plant at Holmesburg.

C. M. Roswell, 62 Marlyn Road, Philadelphia, machinery dealer, is in the market for an air compressor, about 2200 cu. ft. capacity, direct connected to electric motor.

The plant and property of the Vim Motor Truck Co., Fox Street and Roberts Avenue, Philadelphia, totaling 25 acres, has been acquired at public sale by Ralph S. Croskey, Stephen Girard Building, attorney, acting for local industrial interests, name temporarily withheld, which purpose to occupy the plant for kindred manufacture.

The Fairmount Foundry & Machine Co., Fifteenth Street and Indiana Avenue, Philadelphia, is having plans drawn for a one-story foundry, for which bids will be asked in the spring.

The Philadelphia Rapid Transit Co., Seventh and Dauphin Streets, Philadelphia, is having plans drawn for new car repair shops, car barn and terminal, one and two stories.

The Southeast Coal Co., 1732 Commercial Trust Building, Philadelphia, is reported to be planning the installation of additional mining machinery and electric power equipment at its properties in Kentucky. Capital recently was increased to $800,000 for expansion.

The Philadelphia Suburban Gas & Electric Co., West Washington Square, Philadelphia, is disposing of a bond issue of $3,650,000, the proceeds to be used for power-plant construction and other improvements. Morris W. Stroud is president.

Holmes, Inc., 29 Chancery Lane, Trenton, N. J., is having plans drawn for a two-story electric battery and repair works, 55 x 105 ft., to cost about $60,000. F. D. Priory, 11 West State Street, is engineer.

New England

BOSTON, Dec. 11.

MACHINE tool business continues at a minimum. The most important transaction the past week was several thousand dollars worth of new and used equipment, but as it has a Jan. 1 dating, details are lacking. Another sale included a new 24-in. shaper and a used Cincinnati milling machine to the Simplex Wire & Cable Co., Cambridge, Mass., which is also about to close on a new 32-in. shaper. The market, however, is not without encouraging features. Local machine tool dealers expect to shortly close on several thousand dollars worth of equipment for Massachusetts metal workers with the understanding that bills are to have a forward dating. Numerous inquiries involving $4,000 to $5,000 equipment have developed, which are assured of closing shortly. Other inquiries for one, two and three machines, mostly used, contingent on users securing expected orders, are in the market.

The application of the Boston Elevated Railway to the Massachusetts Legislature for permission to borrow several million dollars has revived interest in a large list of tools for its new Everett repair shops. Officials of the company, however, state that actual purchase is several months distant. Interests contemplating the manufacture of a new magneto at Binghamton, N. Y., are in this market with a view to buying production equipment. Sales of machine parts are unusually good for this time of the year, while those of small tools run well ahead of those for December, 1922.

The Crane Market

The market on both electric overhead cranes and locomotive cranes is quiet, buyers showing a tendency to delay purchase until after the first of the year. Competition on current orders is keen, and as a rule the question of price is a leading consideration. Action is expected shortly on the list of cranes for the plant of the General Electric Co. at Philadelphia.

Crane business in the Pittsburgh district has been of fair volume, although the trade describes the market as quiet, probably because of the scarcity of new inquiries. Orders for nine cranes and two trolleys are reported and it is expected that the Standard Sanitary Mfg. Co. will close for the seven cranes for its new plant at Baltimore before Christmas. The Railway & Industrial Engineering Co., Greensburg, Pa., is in the market for a 5-ton, 30-ft. span, 3-motor, overhead crane.

Among recent purchases are:

Government of the Philippines, 17 Battery Place, New York, for Pier No. 7, Manila, P. I., nine 2-ton, 45-ft. span overhead traveling cranes from the Pawling & Harnischfeger Co. and nine 2-ton, 28-ft. span overhead cranes, all 3-motor, from the Shepard Electric Crane & Hoist Co. There is an additional list of gantry cranes not yet closed.

Viele, Blackwell & Buck, 49 Wall Street, New York, a 45-ton, 30-ft. span, 3-motor, power house crane for the Adirondack Light & Power Co., St. Johnsville, N. Y., from the Cleveland Crane & Engineering Co.

J. G. White Engineering Co., 43 Exchange Place, New York, a 40-ton, 42-ft. 9½-in. span, 4-motor, overhead traveling crane for Manila, P. I., from the Northern Engineering Works.

Lake Sand Corporation, Chicago, a 2½-cu. yd. grab bucket, electric trolley from the Northern Engineering Works.

Kentucky Utilities Co., Pineville, Ky., a 40-ton, 4-motor electric traveling crane from the Northern Engineering Works.

Semi-Steel Test Foundry, Chicago, a 7½-ton, 3-motor electric traveling crane from the Northern Engineering Works.

Ford, Bacon & Davis, engineers, 115 Broadway, New York, a 30-ton overhead traveling crane from the Whiting Corporation.

Metallurgic & Chemical Co., 42 Broadway, New York, a 10-ton, 3-motor overhead traveling crane for Matteawan, N. J., from the Whiting Corporation.

Pennsylvania Railroad, Philadelphia, a 15-ton, magnet operating locomotive crane from the Industrial Works.

Sprague Ice & Coal Co., Bridgeport, Conn., a used 10-ton Brownhoist locomotive crane from the Grey Steel Products Co., New York.

Bourne-Fuller Co., Cleveland, two 10-ton, double trolley, electric traveling cranes, 62-ft. and 65-ft. spans, from the Cleveland Crane & Engineering Co.

Yazoo & Mississippi Valley Railroad, a 15-ton pillar crane from the Whiting Corporation.

Atlanta & West Point Railroad, Atlanta, Ga., a locomotive hoist from the Whiting Corporation.

Georgia Railroad, Augusta, Ga., a locomotive hoist from the Whiting Corporation.

Youngstown Sheet & Tube Co., Youngstown, seven 10-ton, long span overhead cranes, three for Youngstown and four for Indiana Harbor, from the Morgan Engineering Co.

National Tube Co., Pittsburgh, a 10-ton electric trolley for the galvanizing department of the Republic works, from the Shaw Electric Crane Co.

American Sheet & Tin Plate Co., Pittsburgh, a 10-ton trolley for the Laughlin works, from the Alliance Machine Co.

Carnegie Steel Co., Pittsburgh, a 5-ton, floor-controlled crane for the McCutcheon works, from the Euclid Crane & Hoist Co.

Missouri Rolling Mill Co., St. Louis, a 5-ton crane from the Shaw Electric Crane Co.

Union Carbide Co., Niagara Falls, N. Y., a 3-ton crane from the Shaw Electric Crane Co.

Atchison, Topeka & Santa Fe Railroad, a 7½-ton crane from the Shaw Electric Crane Co.

New York Central Lines, for Collingwood, Ohio, a 10-ton electric crane from the Shaw Electric Crane Co.

Studebaker Corporation, South Bend, Ind., four 5-ton, two 10-ton and a 3-ton electric cranes from the Shaw Electric Crane Co.

Three electric cranes will be installed in the forge shop extension under construction for the New Departure Mfg. Co., Bristol, Conn., ball bearings, etc., in addition to other equipment. The building will be completed by March 15, and will increase the production of ball bearings at least 50 per cent. The company will install additional equipment in plant A, Bristol, and plant D, Meriden, Conn., to handle the increased output of the forge plant.

The New England High Carbon Wire Co., Millbury, Mass., metal products, recently incorporated under the laws of Massachusetts with a capital of $50,000, will occupy the plant formerly owned by the Millbury Rubber Co., and two small units to be erected shortly. It is planned to start operations next month. Carl Thure Lund, formerly with the American Steel & Wire Co., Worcester, Mass., is president and general manager.

The Manchester Marble Co., East Dorset, Vt., will rebuild its plant destroyed by fire in October and expects to be in operation by April 1. A finishing shop, 29 x 148 ft., and other units will be erected. Electricity will replace steam power heretofore used. Hand cranes are required, as well as pneumatic equipment.

Plans are in progress for a high school on White Street, East Boston, to cost $1,300,000, in which manual training equipment will be installed. Thomas P. Glynn, James J. Mahar and C. H. Blackall, school house department, City Hall Annex, room 1009, Boston, have supervision of the project. John M. Gray & Co., 175 High Street, Boston, are the architects.

The Elliott Addressing Machine Co., 143 Albany Street, Cambridge, Mass., has awarded contract for a five-story, 40 x 90 ft. addition. Plans private.

The C. F. Wooding Co., Wallingford, Conn., house furnishings, has broken ground for three one-story 45 x 125 ft. plant units for manufacturing, annealing and drop forging departments.

The Columbia Cornice & Skylight Co., 268 Elm Street, Cambridge, Mass., will arrange a list of sheet-metal equipment and machine shop apparatus for installation in a new plant, for which work has commenced, to cost about $23,000.

The International Silver Co., Meriden, Conn., has awarded a general contract to the C. F. Wooding Co., Wallingford, Conn., for three additions to its Wallingford works, each one-story, 45 x 125 ft., estimated to cost $60,000.

The Diamond Match Co., Biddeford, Me., will make extensions for the establishment of additional departments to manufacture sash, doors, and kindred products. Electrically-operated machinery will be installed.

The Montaup Electric Co., Fall River, Mass., recently formed by officials of the Fall River Electric Co.; Blackstone Valley Gas & Electric Co., Pawtucket, R. I.; and Edison Electric Illuminating Co., Brockton, Mass., is arranging for a stock issue of $4,500,000, the proceeds to be used for a new electric generating plant at Somerset, to cost $7,500,000 with transmission system. Waterfront property of 46 acres has been purchased.

W. H. Bates, Jr., 49 Gardner Street, Allston, Boston, plans for the purchase of a tilting melting furnace.

The Waterbury Farrell Foundry & Machine Co. Waterbury, Conn., has awarded a contract to the Immick Co., Meriden, Conn., for a two-story addition, 48 x 54 ft., estimated to cost $40,000.

Fire, Dec. 4, destroyed a portion of the three-story woodworking plant of the Banigan Mfg. Co., Elmsville, Conn., with loss estimated at $40,000 including equipment. It is planned to rebuild. John J. and Richard D. Banigan are heads.

Underhill Brothers, 110 Winthrop Avenue, Somerville, Mass., manufacturers of tools, will commence on a one-story addition, 50 x 50 ft.

The Plimpton Lift Truck Corporation, Stamford, Conn., has been organized with a capital of $100,000 to take over and expand the plant and business of the Plimpton Truck Co., manufacturer of industrial and factory trucks. The new company is headed by Bernard E. Scriven and William J. Young, 867 Main Street.

Landers, Frary & Clark, New Britain, Conn., manufacturers of electric heating and cooking equipment, have superstructure work under way on a six-story addition, 65 x 160 ft.

Chicago

CHICAGO, Dec. 10.

GENERALLY speaking, orders are scattered and are confined to single tools. The volume of business actually being placed, however is slightly better than a week ago, and dealers are hopeful that much of the inquiry now pending will soon develop into orders. In many cases, of course, prospective buyers purpose to delay action on their needs until after Jan. 1. No new railroad orders are reported, but the Union Pacific has issued a number of inquiries for a new shop at Los Angeles, and further additions to this list are expected.

The Pettibone-Mulliken Co., Chicago, manufacturer of frogs and switches, has closed for two 6-ft. radial drills, two 3½-ft. radial drills, three universal tool grinders, three 28-in. shapers and eight engine lathes. A Chicago district automobile manufacturer has placed orders for a 42-in. x 42-in. x 10-ft. planer, a 16-in. tool room lathe, a 20-in. shaper and a 7-in. shaper. The city of Chicago has purchased a 20-in. motor-driven shaper for a pumping station. The Chicago Board of Education has not yet closed against its list for the Tilden Technical High School.

Union Pacific List

Three 24-in. engine lathes.
Two 18-in. engine lathes.
Three 50-ton bushing presses.
One link grinder.
Three 34-in. upright drill presses.
Three sensitive drills.
Two 42-in. boring mills.

The Whiting Corporation, Harvey, Ill., has taken the following orders for foundry equipment: One No. 6 cupola for the El Paso Foundry & Machine Co., El Paso, Tex.; one No. 10 cupola for the American Car & Foundry Co., New York; one 36 x 48-in. tumbler for the Milwaukee Gray Iron Foundry Co., Milwaukee, Wis.

The Stewart Storage Battery Co., previously located at Marshfield, Wis., has leased 10,000 sq. ft. of floor space on the third floor of the building at 361 West Superior Street, Chicago, where its manufacturing operations are now being conducted.

The Puritan Bed Spring Co., a new organization engaged in the manufacture of mattresses and bed springs, has leased a four-story and basement plant, containing 10,000 sq. ft. of floor space, at 1258 West Fifteenth Street, Chicago.

Ditto, Inc., manufacturer of duplicating machines, with offices at 530 South Dearborn Street, Chicago, has acquired additional manufacturing space on the second floor of a building at 14-16 North May Street.

Reda Brothers, a new company engaged in the automobile repair business, have purchased property, 100 x 125 ft., at the corner of Crawford and Fillmore Avenues, Chicago. The property is improved with a one-story factory, 42 x 75 ft., and a one-story boiler room, 24 x 40 ft.

William Gaertner & Co., manufacturers of scientific apparatus and precision instruments, 5345-49 Lake Park Avenue, Chicago, will move on Jan. 1 to a new plant, containing 40,000 sq. ft. of floor space, recently completed at Wrightwood and Racine Avenues, at a cost of $150,000.

The Ramapo Ajax Corporation, manufacturer of forgings, 2503 Blue Island Avenue, Chicago, has let a contract for a two-story shop, 29 x 76 ft., to cost $6,500.

J. Milhenning, Inc., jewelry manufacturer, 135 South State Street, Chicago, has awarded contract for a two-story factory, 43 x 120 ft., at 4626-34 Ravenswood Avenue, to cost $48,000.

The Carr, Ryder & Adams Co., manufacturer of interior woodwork, Dubuque, Iowa, plans to construct a five-story factory next spring, increasing its working force by 200 men.

The plant of the Culter & Proctor Stove Co., Peoria, Ill., was recently damaged by fire.

The Wistrand Mfg. Co., manufacturer of agricultural implements, Galva, Ill., has decided to abandon foundry operations and will add the space occupied by the foundry equipment to its general machine shop.

C. E. Niehoff & Co., 149 West Ohio Street, Chicago, recently incorporated with $5,000 capital stock, is manufacturing automotive electric service parts. Officers are Conrad E. Niehoff, president, and M. A. Niehoff, secretary and treasurer.

Fire recently damaged the plant of the Aluminum Mfg. Co., East Moline, Ill.

The National Gear Co., 213 North Morgan Street, Chicago, recently incorporated with $150,000 capital stock, has a completely equipped factory for the manufacture of ring gears and pinions for replacement parts in automobiles. Officers are George H. Daskal, president; D. H. Daskal, treasurer; B. J. Merkle, secretary; David Davis, vice-president; Abram Korff, vice-president.

The Central States Metal Sales Co., 53 West Jackson Boulevard, Chicago, recently incorporated with $5,000 capital stock, will confine itself for the present to the merchandising of iron and steel products. However, it expects to operate a rolling mill later, probably an 8-in. mill. Officers are J. E. Gratteau, president; Frank Siewenie, vice-president and treasurer, and W. E. Yahnker, secretary.

The Rockford Cabinet Co., Twelfth Street and Nineteenth Avenue, Rockford, Ill., has awarded a general contract to the Holmquist, Peterson Co., Swedish-American Bank Building, for a four-story and basement addition, 100 x 225 ft., for a veneering and assembling works, estimated to cost $230,000 with machinery. O. E. Landstrom is secretary.

The Rocky Mountain Marble Co., Carbondale, Colo., is planning for the installation of tools at its machine shop, including a traveling crane.

The Domestic and Foreign Commerce Department, Chicago Chamber of Commerce, 10 South La Salle Street, has received an inquiry from a company at Auckland, New Zealand, desiring to purchase American machinery for the manufacture of plaster wall board and kindred products, No. 2545.

The J. I. Case Threshing Machine Co., 210 East Seventh Street, Waterloo, Iowa, will build a one-story addition, 60 x 60 ft. Fred Bussey is local manager.

The Common Council, Eagle Grove, Iowa, has preliminary plans for a municipal electric power plant. J. K. Baker, city clerk, is in charge.

George Watson, care of Robert E. Watson, 119 South Third Street, Rockford, Ill., is having plans drawn for a one-story machine shop, 42 x 100 ft., on Walnut Street.

The Minnesota Power & Light Co., Duluth, Minn., recently organized to consolidate the Duluth-Edison Electric Co., General Light & Power Co. and the Great Northern Power Co., has preliminary plans for a new hydroelectric power plant in the northeastern part of Minnesota, estimated to cost $25,000,000 with transmission system.

Darling & Co., 4201 South Ashland Avenue, Chicago, are contemplating the erection of a new fertilizer manufacturing plant to replace their works recently partially destroyed by fire, estimated to cost $500,000 with machinery. S. J. Riley, company address, is architect. C. A. Alling is president.

Cleveland

CLEVELAND, Dec. 10.

THE volume of business and inquiry has tapered off with the approach of the end of the year and the trade is looking for a quiet period the remainder of December. There is a fair amount of business in prospect, but in most cases prospective purchasers will not place their orders before January. Sales during the week were virtually all in single machines. No action has been taken by the New York Central Railroad on its recent list and the trade has not been advised whether or not the business will be placed this month.

The Acetylene Stove Mfg. Co., Cleveland, will build a one-story factory, 60 x 160 ft., at East Fifty-ninth Street and Park Avenue at an estimated cost of $20,000. E. L. Davis is secretary-treasurer.

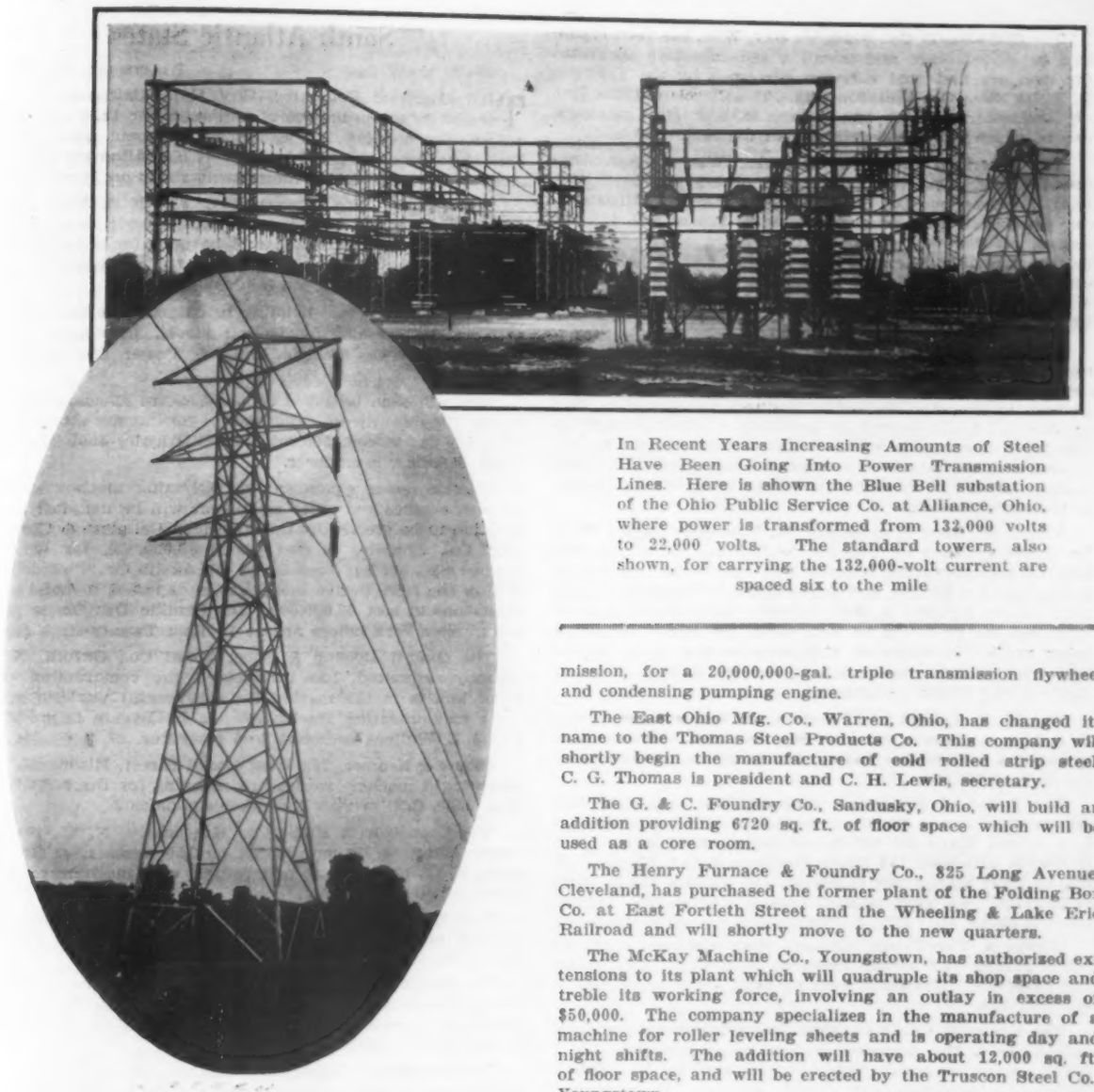
The United States Aluminum Co., 2810 Harvard Avenue, Cleveland, will erect a building, 100 x 300 ft., at an estimated cost of $40,000. It will be used for a smelting department.

The city of Fostoria, Ohio, has completed plans for a sewage disposal plant which will require two 2100-gal. per min. motor driven pumps. W. O. Bulger is city engineer and J. M. Chester, Union Bank Building, Pittsburgh, consulting engineer.

The Columbia-Elyria Power Co., Elyria, Ohio, which has been organized by the Elyria Iron & Steel Co. and the Columbia Steel Co. to build a joint power plant, has engaged B. R. Shorover, Oliver Building, Pittsburgh, as engineer. The plant will have a capacity of approximately 4000 kw. and will cost about $250,000.

The Libby-Owens Sheet Glass Co., Toledo, Ohio, is taking bids on its new plate glass plant, one-story, 187 x 1000 ft. Devore & Co., Nicholas Building, Toledo, are the architects and structural engineers.

The Chicago Pneumatic Tool Co. has completed preliminary plans for a $50,000 extension to its works at 1241 East Forty-ninth Street, Cleveland. The Austin Co., Cleveland, is the structural engineer.



In Recent Years Increasing Amounts of Steel Have Been Going Into Power Transmission Lines. Here is shown the Blue Bell substation of the Ohio Public Service Co. at Alliance, Ohio, where power is transformed from 132,000 volts to 22,000 volts. The standard towers, also shown, for carrying the 132,000-volt current are spaced six to the mile

The A. H. Robinson Co., 5103 Detroit Avenue, Cleveland, sheet metal worker, will erect a two-story and basement factory, 31 x 55 ft.

The Ashtabula Water & Supply Co., Ashtabula, Ohio, is planning extensions to its filtration plant involving an expenditure of $150,000. J. N. Chester, Union Bank Building, Pittsburgh, is consulting engineer.

The American Malleable Casting Co., Marion, Ohio, has taken bids on a two-story addition, 67 x 82 ft., Frank D. Chase, 645 North Michigan Avenue, Chicago, is the engineer.

The Stotter Metal Co., Hanna Building, Cleveland, has commenced the erection of a factory with 8000 sq. ft. of floor space at Bessemer Avenue and East Seventy-eighth Street for the manufacture of white metals. It is in the market for about 30 cast iron kettles of from 1000 to 3000 lb. capacity.

The Mahoning Valley Water Co., Struthers, Ohio, has awarded contract for a $20,000 filtration plant. The G. C. Burnip Construction Co., 223 East Broad Street, Columbus, Ohio, is the general contractor.

The city of Painesville, Ohio, will take bids about Jan. 1 for pumps and water mains involving an expenditure of $150,000. C. S. Fullerton is the city engineer.

The village of Barberton, Ohio, has completed plans and will take bids shortly for water works extensions, including pumping stations and filtration plant. H. W. Alcorn is the city engineer.

The Herbrand Co., Freemont, Ohio, has resumed the erection of extensions to its plant, the first unit of which was started in 1919. The building will be 60 x 740 ft.

The National Standard Co., Niles, Mich., which recently acquired the plant of the Falor Rubber Co., Akron, Ohio, is equipping it for the manufacture of welded wire used in the manufacture of automobile tires.

The city of Erie, Pa., will receive bids Jan. 23 through George C. Gensheimer, secretary of the waterworks commission, for a 20,000,000-gal. triple transmission flywheel and condensing pumping engine.

The East Ohio Mfg. Co., Warren, Ohio, has changed its name to the Thomas Steel Products Co. This company will shortly begin the manufacture of cold rolled strip steel. C. G. Thomas is president and C. H. Lewis, secretary.

The G. & C. Foundry Co., Sandusky, Ohio, will build an addition providing 6720 sq. ft. of floor space which will be used as a core room.

The Henry Furnace & Foundry Co., 825 Long Avenue, Cleveland, has purchased the former plant of the Folding Box Co. at East Fortieth Street and the Wheeling & Lake Erie Railroad and will shortly move to the new quarters.

The McKay Machine Co., Youngstown, has authorized extensions to its plant which will quadruple its shop space and treble its working force, involving an outlay in excess of $50,000. The company specializes in the manufacture of a machine for roller leveling sheets and is operating day and night shifts. The addition will have about 12,000 sq. ft. of floor space, and will be erected by the Truscon Steel Co., Youngstown.

Milwaukee

MILWAUKEE, Dec. 10.

A MORE hopeful view of the immediate future of machine-tool business is appearing in a more active inquiry. Orders are for current and future delivery, but consist mostly of single tools to scattering sources. The American Brass Co., Kenosha, Wis., is purchasing equipment for a new copper wire mill and has placed an order of considerable size for miscellaneous machinery with the Gisholt Machine Co., Madison, Wis. A large order for brewery equipment is being distributed among Milwaukee shops by the Cerveceria Modelo, S. A., Mexico City. This includes some rebuilt and used machinery.

The Wausau Motor Parts Co., Wausau, Wis., which has been incorporated with $50,000, represents a reorganization of the Menominee Piston Ring Co., of Menominee, Mich., the controlling interest in which has been acquired by a group of Wausau capital. The business has been transferred to a leased building in Wausau, and additional equipment is being purchased to make possible an output of 4000 to 5000 piston rings daily. Pistons for gas engines also will be manufactured and other engine replacement parts for the automotive trade are to be added to the line of production. S. E. Johnson, chief engineer, is treasurer of the new corporation. E. H. Viele is assistant secretary-treasurer and general manager.

Edward A. Juul, architect, Security Bank Building, Sheboygan, Wis., has been engaged by an unidentified local interest to design a public garage, sales and service building, 100 x 140 ft., four stories and basement, estimated to cost $100,000. Bids probably will not be taken before Feb. 15, as the project will not mature until spring.

The Cliffs-Smith Co., Sturgeon Bay, Wis., has been organized to manufacture and install a self-unloading apparatus for iron ore and coal carriers, developed by the Leathem D. Smith Dock Co., Sturgeon Bay. The Cleveland-Cliffs Iron Co. has contracted for installations in four steel steamers, two of which have been delivered at the Smith yards.

The American Brass Co., Kenosha, Wis., division Anaconda Copper Co., has placed the general contract with Paul Riesen's Sons Co., 1018 Humboldt Avenue, Milwaukee, for erecting a new copper wire mill, 220 x 540 ft., two stories, of brick and concrete. Orders are being placed for rolling and drawing mills, motors, and special machinery, considerable of which will be built to order by the Gisholt Machine Co., Madison, Wis. C. S. Judd, 570 Elizabeth Street, Kenosha, is vice-president and general manager.

The Wald Mfg. Co., 1801 Martin Avenue, Sheboygan, Wis., manufacturer of motorcycle, bicycle and automobile accessories and small parts, has practically concluded negotiations to transfer its entire business to Maysville, Ky., by Jan 1. Local capital is providing a suitable building. The Wald company is a Wisconsin corporation with $90,000 capital, and will be reincorporated in Kentucky with $125,000 capital. Ewald F. Pawsat is president, and Herman Pawsat is secretary-treasurer.

The C. W. Rood Engineering Co., Wisconsin Rapids, Wis., heretofore engaged in drainage contracting, is entering the field of manufacturing hoisting and excavating machinery. It has leased a factory and acquired the business and equipment of the Johnson & Sons machine shop, which is to be supplemented by a list of new tools, for which inquiry is being made. Members of the Johnson firm have become associated with the Rood company and will manage a custom machine and repair department.

The W. T. Raleigh Co., Freeport, Ill., has engaged J. R. & E. J. Law, architects, First Central Building, Madison, Wis., to design a combination garage warehouse and service building to cost $75,000.

The Board of Education, Kenosha, Wis., will take bids shortly after Jan. 1 for the construction of a new $1,000,000 high school, plans for which are being completed by John D. Chubb, architect, 109 North Dearborn Street, Chicago. It will be three stories and basement, 150 x 250 x 200 ft., with auditorium, two gymnasiums, science laboratories, manual training shops, etc. Ella F. Powers is secretary of the board.

George A. Van Velzer, Elkhorn, Wis., will build a $25,000 public garage and service building, 50 x 95 ft., two stories and basement. Contracts were let Dec. 5 and completion is specified Jan. 15.

The Koehring Co., Milwaukee, has deferred until at least July 1, 1924, the proposed erection of an addition, 120 x 360 ft., plans for which have been prepared by Van Ryn & DeGelleke, architects, 116 Grand Avenue. It is located at Thirty-first Street and Concordia Avenue and manufactures paving and concrete mixer units, contractors' hoists, etc.

The Specialty Mfg. Co., Rice Lake, Wis., has been incorporated with $10,000 capital and will establish a factory for the production of automotive accessories, car equipment, manual tools, etc. The incorporators include C. V. Beggs and O. L. Frederickson.

The Standard Motor Parts Co., recently incorporated at Racine, Wis., has changed its name to the General Parts Corporation, and will enlarge its scope to include production of metal products of all kinds.

The Wisconsin Foundry & Machine Co., Madison, Wis., is marketing a new issue of $35,000 of 8 per cent cumulative preferred stock to finance development of its business and production. It manufactures castings, metal products, machinery and supplies for mines, steam plants, creameries, stone quarries, automobile repair shops and similar purposes, and is also a jobber in electric motors, dynamos, power plant specialties, etc. G. W. Botham is president, and A. J. Buenzli, treasurer and general manager.

Trade Changes

The Atlantic Coast Shipbuilders' Association has moved its executive offices from 1701 Walnut Street, Philadelphia, to 1600 Walnut Street, same city.

The Blaw-Knox Co., Pittsburgh, announces that Charles K. Wehn will have charge of a special department devoted to Blaw-Knox standard steel buildings and structural steel in Illinois and adjoining states, with headquarters in the Peoples Gas Building, Chicago.

The Pawling & Harnischfeger Co., Milwaukee, manufacturers of excavators, cranes and machine tools, have appointed N. P. Farrar as district manager, with offices at 605 Stephen Girard Building, Philadelphia, and 50 Church Street, New York.

South Atlantic States

BALTIMORE, Dec. 10.

THE Board of Estimates, City Hall, Baltimore, has included in the ordinance of estimates for 1924 an item of $65,000 for erecting and equipping a repair plant for the Fire Department. It will be built at Key Highway and Fort Avenue and will replace the present shops on Market Place.

The Holtson Mfg. Corporation, 119 East York Street, Baltimore, recently incorporated with $10,000 capital stock, has acquired a plant which will be used for a general machine shop, gas engine repairing and the manufacture of oil burners. James B. Holtson is president.

A two-story service building to cost $57,000 will be built at Fort Avenue and Leadenhall Street, Baltimore, by the Consolidated Gas, Electric Light & Power Co., Lexington Building.

Bids will soon be asked by the General Elevator Co., 400 South Charles Street, Baltimore, for a one-story plant, 67 x 160 ft., to cost $60,000. W. S. Austin, 1002 Maryland Trust Building, is engineer.

Electric power equipment, refrigerating machinery, filter presses, engines and other equipment will be installed in the addition to be erected by the American Cellulose & Chemical Mfg. Co., Amcelle, to cost about $2,000,000, for which a general contract has been let to the Austin Co., Philadelphia. Within the next twelve months it is expected to build other extensions to cost $3,000,000. Dr. Camille Drayfus is president. New York offices are at 15 East Twenty-sixth Street.

The Oxford Roofing & Sheet Metal Co., Oxford, N. C., recently organized, has commenced the construction of a plant and is in the market for sheet-metal working equipment and operating machinery. L. E. Byrum is president, and J. J. Walters, secretary and treasurer.

Evans & Kramer, 232 West Broad Street, Richmond, Va., operating a machine works, are planning for the installation of a lathe, drill presses and other equipment.

The Cunningham Brick Co., Greensboro, N. C., plans a power house at its new works on 150 acres near Gordontown, N. C., estimated to cost $80,000 with machinery. I. H. Cunningham is president.

The Hamlet Ice Co., Hamlet, N. C., will commence the erection of an ice-manufacturing and cold storage plant to cost $100,000 including machinery.

The Bureau of Foreign and Domestic Commerce, Washington, has information of a project in South America for which American canning machinery to cost about $60,000 will be purchased. Reference No. 12928.

The Dorchester Lumber Co., Badham, S. C., has inquiries out for two electric generators and auxiliary equipment, from 50 to 60 kw. and 25 to 30 kw. capacity respectively.

The Southern Public Utilities Co., Piedmont, S. C., is disposing of a bond issue of $4,000,000, a portion of the proceeds to be used for extensions. It is building a new hydroelectric power plant at Mountain Island. E. C. Marshall is president.

The Shambow Shuttle Co., Woonsocket, R. I., has acquired the former plant of the Cyclone Motors Corporation, Greenville, N. C., and will remodel for new works, estimated to cost $250,000. It is planned to remove company headquarters to this location. J. C. Shambow is president.

The Hackley-Morrison Co., Inc., 1708 Lewis Street, Richmond, Va., machinery dealer, is in the market for an electric alternator, 125 kw. capacity, belted type, with exciter, switchboard and auxiliary apparatus.

In connection with a project for the construction of a pipe line, pumping plants, oil refinery, power house and other structures, estimated to cost $20,000,000, to be carried out by a Canadian corporation in Colombia, South America, in accordance with Government concession, recently granted, one of the officials is now in the United States for the purchase of a portion of the equipment. Full information, with the New York address of purchasing officer, is available at the office of the Bureau of Foreign and Domestic Commerce, Washington. Reference No. Colombia 35 xa.

D. P. Martin, Cobbtown, Ga., is in the market for an oil-operated engine, about 25 hp. capacity, with auxiliary equipment.

The City Table & Mantle Co., Fremont Avenue and Briscoe Street, Baltimore, has purchased the factory of the United States Lithographing Co., 425-29 Grindall Street, and will remodel it for new works.

Bids will be received by the general purchasing officer, Panama Canal, Washington, until Dec. 19 for two boiler feed pumps, 3000 ft. plow steel wire rope, two chain hoists, 2500 ft. brass condenser tubes and other miscellaneous equipment, circular 1579; until Dec. 17 for 200 tender-brake shoes, 500

steel drums, 12,500 lb. common wire nails, 200 lb. copper nails, cold rolled sheet copper, bronze and other kindred material, circular 1578.

The Bureau of Foreign and Domestic Commerce, Washington, has information of a company at Minieh, Egypt, in the market for American machinery for a cottonseed oil mill, No. 8376; also of a firm at Merida, Yucatan, desiring to purchase baking machinery, No. 8390.

The Southern Power Co., Charlotte, N. C., has tentative plans for a steam-operated electric generating plant in the vicinity of Lyman, S. C.

The Southern Iron & Equipment Co., 217 Grant Building, Atlanta, Ga., has inquiries out for a boring mill, motor-driven, 42 in., Bullard or King type; also for one bending roll, 10 to 12 ft.

M. P. Moller, Hagerstown, Md., operating a local plant for pipe organ manufacture, and head of the Crawford Automobile Co., has purchased the former plant of the Maryland Metal Products Co., previously acquired by the Poole Engineering & Machine Co., Baltimore, and later resold to Raymond J. Funkhouser, Hagerstown. It will be remodeled by the Crawford company for the manufacture of taxicabs and parts.

W. H. Allen, Elizabethton, Tenn., has acquired property at Marion, Va., for a new brick manufacturing plant, to include power house, estimated to cost $55,000 with equipment. A company will be organized.

The City Council, Florence, S. C., plans the installation of electric pumping machinery in connection with waterworks and sewerage plants to cost $350,000. Bonds have been voted.

The Bedford Tire & Rubber Co., Bedford, Va., recently formed with a capital of $1,000,000, has plans for the initial unit, 80 x 300 ft., estimated to cost $125,000 with machinery. L. R. Gills is president, and J. J. Scott, secretary and treasurer.

The Susquehanna Power Co., Elkton, Md., is perfecting plans for a new hydroelectric generating plant at Conowingo, Md., on the Susquehanna River, with ultimate capacity of 500,000 hp., to cost $1,500,000 with machinery. A transmission system will be built through the Delaware and Maryland peninsula districts.

The United States Engineer Office, Old Federal Building, Wilmington, Del., will receive bids until Dec. 20 for two feed water heaters.

The Quartermaster, United States Marine Corps, Washington, will take bids until Dec. 28 for 200 machine bolts, 20,000 insulated staples, 200 clamps, 31,000 ft. wire, 200 batteries and other equipment, schedule 255.

The Mallory Machinery Corporation, 522 Light Street, Baltimore, is in the market for used equipment as follows: Two double-cylinder, double-drum and swinger steam hoists without boilers, cylinders 10 x 12 or larger; also two stiff-leg derricks, 40 or 50 ft. and boom 50 or 60 ft., with capacity of 40 to 50 tons.

St. Louis

ST. LOUIS, Dec. 10.

A BOND issue of $200,000 is being considered by the City Council, Fort Scott, Kan., for a municipal electric power plant. Roger Toles is engineer.

The Handy Motor Co., Linwood and Holmes Streets, Kansas City, Mo., Jefferson W. Handy, head, is considering plans for a two-story and basement service and repair building, 105 x 120 ft., to cost $100,000.

Bids will be received by the Board of Public Service, 208 City Hall, St. Louis, until Jan. 2 for a refrigerating plant for municipal service, including 8 and 15-ton compressors, brine tank and equipment, freezing tank, etc.

The Missouri Power & Light Co., Jefferson City, Mo., recently organized to take over and consolidate ten electric light and power companies, is disposing of a bond issue of $4,000,000, a portion of the proceeds to be used for expansion. Plans are being considered for a central steam-operated generating plant, with transmission system, to cost in excess of $2,000,000 with equipment. Clement Studebaker, Jr., connected with the Studebaker automobile interests, South Bend, Ind., is president.

The Taskee Iron & Ore Co., Wappapello, Mo., contemplates the construction of a new concentrating plant and washery in the vicinity of Taskee, Mo., estimated to cost $100,000 with machinery. All equipment will be electrically operated. H. E. Springer and I. W. Rodgers head the company.

Bids will be received by Frank Preston, city clerk, Holden, Mo., until Dec. 18 for four 250,000-gal. capacity centrifugal pumps, with motors; 10,000-gal. steel tank on 120-ft. tower, 100,000-gal. capacity, with auxiliary equipment, for extensions in the municipal waterworks. E. E. Harper, 3031 Park Avenue, Kansas City, Mo., is consulting engineer.

The Board of Education, Pine Bluff, Ark., plans a complete department for vocational and manual training at the proposed local junior high school, estimated to cost $280,000, for which plans will soon be available.

The Morse Engineering Co., 1626 Chemical Building, St. Louis, has inquiries out for a Diesel engine, about 100 hp. capacity; also for 50 to 75 hp. electric alternators.

The Common Council, Norborne, Mo., is having plans drawn for a municipal light and power plant and waterworks, estimated to cost $130,000 with equipment. J. P. Davis, 305 Central Trust Building, is consulting engineer.

The Marquette Cement Co., Cape Girardeau, Mo., has awarded a general contract to the McDonald Engineering Co., Chicago, for additions in its plant, including a three-story packing and loading works, estimated to cost $100,000 with equipment.

The Southwestern Light & Power Co., Oklahoma City, Okla., has arranged an appropriation of about $700,000 for extensions in its steam-operated electric generating plant, including the installation of a new 3300 kva. turbo-generator, boilers, cooling tower, switchboard and other equipment; also for extensions in transmission system to Quanah, Tex., and other points.

The Milton Oil Co., Sedalia, Mo., has inquiries out for a number of portable metal buildings, suitable for warehouse and kindred service. Eugene H. Milton is president.

The Polar Wave Ice & Fuel Co., 3626 Olive Street, St. Louis, has leased a two-story building to be erected on Penrose Avenue, 122 x 230 ft., for a new ice and refrigerating plant, to cost $175,000. H. G. Clymer, Wainwright Building, is architect.

The Common Council, Festus, Mo., plans the installation of electric pumping machinery at the proposed municipal waterworks and sewerage plant, for which bonds for $175,000 have been voted.

A manual training department will be installed in the two-story and basement addition to be erected at the school on Independence Avenue, Mount Washington, Mo., estimated to cost $210,000, for which foundations will be laid at once. The Board of Education is in charge.

The Producers' Cold Storage Co., Chillicothe, Mo., will take bids at once, to be opened early in January, for ice and refrigerating machinery for installation in its two-story and basement plant, 63 x 140 ft., at Trenton, Mo., to cost about $90,000. J. R. Sparks, Chillicothe, is architect. F. G. Peters is general manager.

Buffalo

BUFFALO, Dec. 10.

PLANS are being perfected by the Doehler Die Casting Co., Court and Ninth Streets, Brooklyn, N. Y., for a new plant at Batavia, N. Y.

The American La France Fire Engine Co., Elmira, N. Y., manufacturer of motor-driven fire equipment, has acquired property at San Francisco for a branch assembling plant, with repair department, estimated to cost $200,000 with equipment.

The Morrison Auto Sheet Metal Works, 26 East North Street, Buffalo, is taking bids on general contract for a five-story plant, 90 x 140 ft., to cost approximately $190,000. It is understood that the company will occupy a portion only of the building for the present. G. M. Wolfe, 1377 Main Street, is architect.

The Hadley Paper Corporation, Hadley, N. Y., plans the installation of additional equipment, including transmission apparatus. R. H. Redlin is general manager.

The Pennsylvania Railroad Co., Pennsylvania Terminal, New York, has plans for a one-story machine shop at Olean, N. Y., to cost $50,000.

Power equipment, conveying, hoisting and other machinery will be installed in the flour milling plant to be erected at Buffalo by the Russell-Miller Milling Co., Minneapolis, Minn., estimated to cost $750,000.

Bids on general contract have been called by the Rome Mfg. Co., Railroad Avenue, Rome, N. Y., manufacturer of forgings, etc., for its proposed additions, one and two-stories, estimated to cost $200,000. Lockwood, Greene & Co., 101 Park Avenue, New York, are architects and engineers.

S. Adams & Sons, South George Street, Rome, N. Y., manufacturer of agricultural implements, etc., plan the installation of additional foundry equipment to replace a recent fire loss.

The Kensington-Davis Corporation, 144 Kensington Ave-

nue, Buffalo, has awarded a general contract to the Austin Co., Cleveland, for a one-story foundry, 140 x 305 ft., to cost approximately $125,000 with equipment.

The Adams Axle Co., Syracuse, N. Y., an interest of the Durant Motors, Inc., 1819 Broadway, New York, will operate a plant for the manufacture of automobile axles, taking over this branch of the parent company's business heretofore conducted at Findlay, Ohio.

The Kitts Steam Specialty Co., 56 East Second Street, Oswego, N. Y., manufacturer of power house equipment, has preliminary plans for additions and the installation of new equipment.

The American Auto Parts & Service Co., Buffalo, will build a one-story works, 45 x 105 ft., at 82 Broadway. Jacob Dworkin is one of the heads of the company.

Fire, Dec. 1, destroyed a portion of the four-story plant of the W. A. Case & Son Mfg. Co., 42-48 Washington Street, Buffalo, manufacturer of pipe, plumbing equipment, etc., at 31-33 Main Street, with loss estimated at $200,000, including equipment. It is planned to rebuild.

The Standard Oil Co. of New York, 26 Broadway, New York, plans for the construction of storage and distributing plants at Medina, Albion and other points on the New York State Barge Canal, to cost more than $250,000 with equipment.

The Fearless Dish Washer Co., Rochester, N. Y., is planning the installation of equipment at its plant, 175 Colvin Street, to replace machinery recently damaged by fire.

Cincinnati

CINCINNATI, Dec. 10.

ORDERS for machine tools continue at a fair rate and to date December shows hardly any slackening compared with the same period in November. Some railroad lists are reported to have been closed the past week, including one issued by the Chicago Milwaukee & St. Paul a few months ago, and on which a number of lathes were bought. Purchasing by the automotive industry has slackened somewhat, but a fair volume of orders is still coming from this source.

Buying from the general industrial field is fair, though orders are confined to one and two machines. Indications at present point to a large number of inquiries now pending being postponed until after the first of the year. Several railroad lists, in course of preparation, are expected to be out the last week of December, as the roads are said to be in need of the equipment and would have purchased sooner had not the appropriations already been expended.

The U. S. Engineers' Office, Louisville, Ky., will open bids Jan. 3 for furnishing, delivering and erecting gates for Lock No. 45, Ohio River.

The Standard Pulley & Mfg. Co., Cincinnati, has been organized with a capitalization of $100,000 and is practically a reorganization of the Standard Pulley Co. It will erect a machine shop at 1738 Powers Street, adjoining the foundry building now occupying part of the site. Considerable machine tool equipment will be purchased. J. F. Jewett, 1738 Powers Street, is one of the incorporators of the company.

The Lunkenheimer Co., valve manufacturer, Cincinnati, is having plans prepared for an addition, bids on which will be taken about Jan. 1. The building will probably be of steel construction, six stories, 140 x 490 ft.

The W. F. Robertson Steel & Iron Co., Cincinnati, which recently purchased the plant of the Hudson Sheet & Tinplate Co., Marietta, Ohio, has not as yet determined what disposition will be made of the property, though it is reported that the plant will be operated in connection with a large can manufacturing works to be erected there. Definite announcement of plans is expected before the first of the year.

The Eagle Waystop & Signal Co., Cincinnati, has been incorporated with a capitalization of $25,000 to take over the business formerly conducted by Henry Backer & Co., at 2016 Elm Street. The company, in addition to manufacturing tools, dies and fixtures, will manufacture a special stop signal lamp for automobiles.

The Troy Metals Products Co., Springfield, Ohio, will move its plant to Troy, Ohio, about Feb. 1, and has purchased the former plant of the McKinnon Dash Co. It manufactures automobile parts and accessories, besides doing general contract work.

The Cardiff Brick & Tile Co., Rockwood, Tenn., is planning for extensions and the installation of mechanical drying machinery, power equipment and other apparatus. S. N. Oakley is secretary.

Fire, Dec. 2, destroyed a portion of the plant of the Valley Cotton Oil Co., Memphis, Tenn., with loss estimated at $150,000 including machinery. It is planned to rebuild.

The Day-Evans Iron Works, Inc., Knoxville, Tenn., has commenced work on its proposed plant for the manufacture of mine cars, mine car wheels, etc., consisting of a one-story foundry, 75 x 160 ft.; one-story machine shop, 72 x 160 ft.; one-story forge shop, 25 x 48 ft.; core room, 36 x 48 ft., and other structures. A. W. Evans is general manager.

The Sawbrook Steel Castings Co., Elmwood Place, Cincinnati, has been incorporated with capital stock of $300,000. It expects to do a local business, producing about 150 tons per month and specializing on annular section work, such as gear blanks. Contracts will be placed shortly for building and equipment. E. S. Sawtelle is president; A. E. Anderson, vice-president, and E. L. Brooks, secretary-treasurer.

Detroit

DETROIT, Dec. 10.

FURTHER expansion of the Fisher Body interests has been announced by Charles T. Fisher, vice-president, which provides for the reconstruction and enlargement of the plate glass plant at Blairsville, Pa., and for the erection of another plant at Ottawa, Ill., larger than the one now in operation. These are both operated by the National Plate Glass Co., a subsidiary of the Fisher corporation, with headquarters in Detroit. Rebuilding of the Blairsville plant is under way and it is estimated that the new work will cost approximately $5,000,000. The Ottawa plant is estimated to cost about $10,000,000.

The Chatfield Foundry Co., Escanaba, Mich., has purchased the Nau Brass Foundry of Manistique, Mich., and will merge the two companies in the Chatfield plant. Mr. Nau will retain an interest in the consolidation.

The Conant-Donalson Co., Kalamazoo, Mich., which purchased the plant of the Acme Universal Joint Co., is planning to produce a line of tools after the first of the year in addition to its production of universal joints.

The Whyte Motor Products Co., a Chicago concern, has moved its plant to Muskegon Heights, Mich., having taken over 25,000 sq. ft. of floor space in the Michigan Washing Machine Co. building. It manufactures the Whyte motor-control for automobiles. Machinery is being moved from the Chicago plant and some additional equipment will probably be purchased in the near future. The company has been incorporated in Michigan with a capitalization of $1,000,000. The officers are L. T. Jamme, president; C. E. Mitchell, secretary; Joseph A. Jones, sales manager, all of Chicago. Benjamin J. Affleck, president Universal Portland Cement Co., is a member of the board of directors.

The Sauzedde-Buchanan Mfg. Co., Mt. Clemens, Mich., tool manufacturer, has leased a portion of the Sarns machine shop for increased production. It will soon begin the manufacture of the Sauzedde automobile wire wheel on a royalty basis.

The Ornamental Bronze Co., Big Rapids, Mich., has been organized by E. R. and E. F. Deady to manufacture bronze tablets, architectural bronze, etc. It is at present operating in a part of the Binney Machine Co.'s plant.

The Hugh Lyons Co., manufacturer of metal fixtures, Lansing, Mich., plans to erect a two-story factory, 60 x 200 ft.

The Atlas Drop Forge Co., Lansing, Mich., will increase its power plant within the next year by the addition of some boiler capacity, monorail coal conveyor and automatic stokers.

Plans have been filed by the Michigan Stamping Co., 11631 Mack Avenue, Detroit, for a five-story addition estimated to cost $750,000 including machinery. Albert Kahn, 1000 Marquette Building, is architect.

The Michigan Carton Co., Battle Creek, Mich., will commence the erection of a two-story addition, 170 x 270 ft., to cost about $35,000. M. J. Morehouse, 343 South Dearborn Street, Chicago, is architect.

R. C. Silver, 521 Free Press Building, Detroit, machinery dealer, has inquiries out for a punch, shears, band saw and other similar heavy duty tools.

The Aetna Portland Cement Co., Essexville, Mich., is planning for additions and the installation of new kilns, electric power equipment and other machinery, estimated to cost $225,000. Work will commence in the spring.

The Ford Motor Co., River Rouge, Detroit, has awarded a contract to the Bryant & Detwiler Co., Dime Bank Building, for the erection of an addition to its main motor works, to cost $150,000.

The Flat Rock Chuck Co., Flat Rock, Mich., is planning for the installation of nickel plating and other equipment.

The MacRay Concrete Products Co., 1425 Ravine Road, Kalamazoo, Mich., recently organized, will commence the erection of a plant, 50 x 85 ft., to cost $25,000 with machinery. William MacKinzie and Edward G. Raymond head the company.

The Reo Motor Car Co., Lansing, Mich., is completing arrangements for the purchase of the plant of the Duplex Truck Co., for about $200,000. It will extend the buildings and install additional equipment for assembling busses and other special cars. The Duplex company plans to continue operations on a smaller scale at its Charlotte, Mich., works.

The Michigan Electric & Mfg., Co., Lake Linden, Mich., has been incorporated with $75,000 capital stock to manufacture fractional horse power electric motors and similar products. Physical assets and the plant of the Calumet Motor Co. have been purchased. The company is in the market for materials for the manufacture of these products. F. C. Perry is president and general manager, and F. W. Vigelius, secretary-treasurer.

Indiana

INDIANAPOLIS, Dec. 10.

CONTRACT has been let by the Overhead Door Co., Hartford City, Ind., to J. E. Clark, Hartford City, for the erection of a new plant to cost about $40,000.

The Greencastle Gas & Electric Co., Greencastle, Ind., is planning for the installation of a water-gas set and other equipment at its gas works.

The Premier Motors, Inc., Indianapolis, is installing additional equipment at its plant and proposes to double the output of taxicabs and other automobiles.

The Rybolt Heating Co., Indianapolis, has work under way on a new plant at 1414 North Capital Avenue, for the manufacture of heating equipment.

The Wayne Tank & Pump Co., Fort Wayne, Ind., has awarded a general contract to the Indiana Engineering & Construction Co., Central Building, for a one-story addition, 80 x 220 ft., to cost approximately $55,000.

The Consumers Power Co., Owensville, Ind., has acquired the plant and property of the Owensville Light Co., and plans for extensions and the installation of additional equipment.

The Standard Oil Co., of Indiana, Indianapolis, is planning for the installation of equipment at its refinery at Casper, Wyo., for a new unit for the production of asphalt products, including stills, pumping and mixing machinery, etc.

The Rochester Gas & Fuel Co., Rochester, Ind., will install a new water-gas set and other equipment.

Pittsburgh

PITTSBURGH, Dec. 10.

MACHINE tool business still is light in this district. Interest of the trade centers in the inquiry of the Standard Sanitary Mfg. Co., which now is tabulating bids on 30 tools for its new Baltimore plant. Awards against this list are expected soon. An outstanding power equipment order of the week has been one from the Carnegie Steel Co. for six steam-driven, 50,000-cu. ft.-per min. turbo blowers for its Carrie furnaces, Rankin, Pa., to the Ingersoll-Rand Co.

The Carnegie Steel Co., Pittsburgh, has put out an inquiry for 15 waste heat boilers, each with a capacity for developing 450-hp., to be installed in the open-hearth steel department of its Farrell plant.

Plans are being considered by the Acme Steel Construction Co., Homestead, Pa., for new works on property recently acquired in the Wickliffe industrial section, Youngstown, Ohio.

The Dayton Taxicab Co., Inc., East Pittsburgh, has leased the former plant of the Deidrick Glass Co., Monaca, Pa., for a new works. Remodeling and equipment installation will soon commence.

The Board of Water Commissioners, 701 French Street, Erie, Pa., G. C. Gensheimer, secretary, will soon take bids for a high duty pumping engine, triple expansion type, for the municipal waterworks.

H. M. Waugh, Bluefield, W. Va., has inquiries out for a number of industrial dump cars, each about 12 cu. yd. capacity.

The United States Auto Chain & Twin Hook Co., Grafton, W. Va., is concluding arrangements with the Chamber of Commerce, Oakland, Md., for a 10-acre site for a new plant to cost approximately $100,000 with equipment. It is proposed to remove the Grafton works to the new location.

H. E. Rutherford and S. F. Lucas, Tarentum, Pa., are organizing a company to construct a glass plant in this section, to cost close to $1,000,000 with machinery. It will include a power house.

Electric power equipment, conveying apparatus and other equipment will be installed in the two-story and basement printing plant to be erected by the Ohio Valley Publishing Co., Parkersburg, W. Va., for which T. T. Sansbury, Guarantee Building, is architect. R. L. McFarland is president and general manager.

The Gulf States

BIRMINGHAM, Dec. 10.

WORK will commence by the Houston Power Co., Newton, Ala., for a hydroelectric generating plant with initial capacity of 5000 hp., estimated to cost $500,000 with machinery and power dam.

The American Arsenic Co., Inc., 506 Lincoln Life Building, Birmingham, contemplates the erection of a reduction plant in the vicinity of Cragford, Ala., with by-products works for gold, lead and other metal recovery, estimated to cost $150,000 with machinery.

Fire, Dec. 3, destroyed a portion of the mill of the Gulf Paper Co., Mobile, Ala., at Crichton, Ala., with loss estimated at $200,000 with equipment. Rebuilding is being considered. J. M. Walsh is president, and G. H. Mackie, local manager.

The Port Arthur Ice & Refrigerating Co., Port Arthur, Tex., has plans for new works estimated to cost $325,000 with machinery. Stone & Webster, Inc., 147 Milk Street, Boston, is architect and engineer.

Broadbent & Groeting, Ocala, Fla., have inquiries out for a steam shovel, Erie or Bucyrus type, with ¾-yd. capacity clamshell bucket, with or without shovel attachment.

The Southern Cement Products Co., Menchaca Street, San Antonio, Tex., has acquired adjoining property and plans a one-story addition.

The Texas & Pacific Railway Co., Dallas, Tex., now being reorganized, has preliminary plans for new car and locomotive repair works at the local Belt Line junction and its right of way, to cost $1,000,000 with equipment. J. F. Lancaster is receiver for the road.

The York Engineering & Supply Co., 2201 Texas Avenue, Houston, ice and refrigerating equipment, oil well equipment, etc., contemplates a new four-story plant and distributing works, 100 x 150 ft., estimated to cost $85,000 with equipment.

The Humble Oil & Refining Co., Houston, Tex., plans to rebuild the portion of its works at Mildred, Tex., recently destroyed by fire with loss estimated at $100,000, including equipment.

Bids will be received by the Board of Commissioners of the Port of New Orleans, New Court Building, until Dec. 20, for steel rolling doors, about 28,000 sq. ft. Requisition E. D. 14360. Specifications at the office of the Supervisor of Purchases, 1 Canal Street. J. H. Walsh is general manager.

The Heinze Engineering Laboratories, Tampa, Fla., manufacturer of mechanical equipment, has tentative plans for the establishment of a branch factory at El Paso, Tex.

The Texas Boiler Works, 3214 Hickory Street, Dallas, Tex., plans the installation of electric welding equipment. H. H. Sharp is one of the heads of the company.

The City Council, Miami, Fla., is planning for extensions in the municipal electric light and power plant to double the present capacity. H. H. Hyman is superintendent.

The Southern Utilities Co., West Palm Beach, Fla., plans extensions in its local power plant, including the installation of additional boilers, turbines and auxiliary machinery.

The Florida East Coast Railway Co., St. Augustine, Fla., has tentative plans for repair shops, yard and terminal in the vicinity of Bowden, Fla., to cost $100,000. W. G. Brown, engineering department, St. Augustine, is engineer in charge.

Manual training equipment will be installed in the new high school to be erected at Tavares, Fla., estimated to cost $200,000, for which bids will soon be called on a general contract. Alan J. McDonough, Eustis, Fla., is architect.

The Chamber of Commerce, Rockdale, Tex., is interested in a project for a local oil manufacturing plant, to be operated by a compnay headed by C. W. Arlitt, Austin, Tex., to cost $75,000.

A. B. Hale, Tampa, Fla., is perfecting plans for the organization of a company to build an ice-manufacturing and cold storage plant at Orlando, Fla., to cost $80,000.

The Silicon Products Co., Tredegar, Ala., will establish a plant for the manufacture of silica brick and kindred products.

estimated to cost $90,000, including equipment. A reduction mill will also be built. Contracts for a portion of the equipment are being let. James & Breckler, Louisville, are chemical engineers. Charles L. Jackson is one of the heads of the company in charge.

Sutton, Steele & Steele, Inc., Forney Avenue, Dallas, Tex., manufacturer of machinery, is planning the installation of an electric generator and auxiliary equipment.

The Common Council, Oak Grove., La., is planning the installation of a municipal electric light and power plant. A new waterworks, with electrical pumping equipment, is also under consideration.

Bids will be received by H. L. Stark, chairman, Board of Regents, University of Texas, Orange, Tex., until Jan. 14 for the construction of a power house at the Medical College at Galveston, in connection with a new administration building, estimated to cost $300,000. The H. M. Greene Co., North Texas Building, Dallas, is architect.

The H. & H. Machine Works, First Avenue, Decatur, Ala., has tentative plans for a new plant. Negotiations are under way for the purchase of a site.

Pacific Coast

SAN FRANCISCO, Dec. 5.

BIDS will be received by the Bureau of Yards and Docks, Navy Department, Washington, until Jan. 16 for a fuel oil storage plant at the Mare Island Navy Yard, including four motor-driven centifugal pumps; one motor-driven agitating pump; air compressors; two 50,000-bbl. fuel oil tanks; tanks on steel towers and auxiliary equipment, specification 4717.

The Ward Heater Co., 1314 South Central Avenue, Los Angeles, manufacturer of gas furnaces and heaters, is having plans drawn for new works consisting of foundry, plating works, assembling shop and other buildings, estimated to cost $250,000 with machinery. Benjamin J. Bloser, Consolidated Realty Building, is architect.

The Hawley Pulp & Paper Co., Oregon City, Ore., has tentative plans for a new plant at Third and Main Streets, with power house, estimated to cost $1,000,000 with machinery.

The Board of Education, Venice, Cal., is planning for an addition to its mechanical arts school to cost about $50,000. Machine tools and other equipment will be installed.

The W. B. Bastian Mfg. Co., 2117 Violet Street, Los Angeles, manufacturer of water heaters, has preliminary plans for a branch plant at Emeryville, Cal., estimated to cost $85,000.

Coony & Winterbottom, 1400 Santa Fe Avenue, Los Angeles, manufacturers of pipe, plumbing equipment, etc., will commence the erection of a one and two-story plant, 95 x 145 ft., on Hunter Street, to cost $50,000 with equipment.

The Portland Pulp & Paper Co., Portland, Ore., Roy H. Mills, 815 Broadway Building, president, organized with a capital of $1,500,000, is planning for a new pulp and paper mill near Portland, to cost $750,000 with machinery. A power house will be erected. D. E. Fry is also interested in the new company.

The Central Oregon Sugar Co., Portland, Ore., has awarded a general contract to the Schwartz Engineering Co., Denver, Colo., for a new refinery at Prineville, Ore., with daily output of about 400 tons, estimated to cost $700,000 with machinery. A. C. Goodwin is president.

The Hoyt Heater Co., 2850 East Second Street, Los Angeles, manufacturer of automatic water heaters, is having plans drawn for a one-story factory, 70 x 200 ft., to cost $35,000. Walker & Eisen, Pacific Finance Building, are architects.

The Riddle Sheet Metal Works, 1067 Folsom Street, San Francisco, has awarded contract to Otto Johnson, San Francisco, for a two-story addition, estimated to cost $20,000. Plans are also being drawn for an extension to cost $15,000. Dodge A. Riedy, Pacific Building, is architect.

The Washington Irrigation & Development Co., Henry Building, Seattle, is planning for a hydroelectric generating plant on the Columbia River, near Priest Rapids, with capacity of 350,000 h.p., estimated to cost $5,000,000.

The Lyons-California Glace Fruit Co., Salem, Ore., is having plans drawn for a four-story ice-manufacturing and cold storage plant, estimated to cost $450,000 with machinery. A. C. Raas is local manager.

The Gypsum Tile Factory, Inc., Huntington Park, Cal., has plans for new works on Slauson Avenue, estimated to cost $50,000 with equipment. N. J. Martin heads the company.

The Pacific Wire Screen Co., Los Angeles, is having plans prepared for a one-story factory on East Fifteenth Street, 72 x 240 ft., to cost $65,000. Gordon La Barr, 4110 Moneta Avenue, is architect.

The National Ice & Cold Storage Co., Postal Telegraph Building, San Francisco, is negotiating for property at Hayward, Cal., as a site for a new ice-manufacturing and cold storage plant to cost approximately $80,000.

Canada

TORONTO, Dec. 10.

MACHINE-TOOL inquiries are numerous in most lines, and while individual sales are chiefly for small lots, buyers are fairly numerous and the aggregate orders reach a very good volume. Although no special industry can be singled out as the most active purchaser, the automotive industry is furnishing a good share of the demand and woodworking equipment for saw and lumber mills is also well up on the list.

The Canadian railroads have not ordered any large volume of equipment during the past two or three months, but it is thought that these interests will send out lists again soon after the first of the year.

E. Poulin, 133 Dupont Street, Quebec, is asking for a small lathe.

J. H. Rattray, Wallace Block, Cobalt, Ont., is in the market for mining machinery.

A. Sirois, Rimouski, Que., is in the market for a drum saw and a self-feed rip saw for a lumber mill.

The John Lewis Peg & Box Co., Ship Harbor, N. S., whose factory was recently destroyed by fire, will rebuild without delay and is interested in woodworking equipment.

L. Pelletier, Rimouski, Que., will erect sawmill and is asking for equipment.

Goddard & Appleby, 664 Union Avenue, Montreal, is in the market for equipment for an automobile repair shop, including lathes, emery stand, etc.

The Canadian Bridge Co., Walkerville, Ont., has started work on an addition to its galvanizing plant to cost $8,000.

The Western University, London, Ont., will spend $50,000 on equipment for a laboratory. J. H. Moore, 489 Richmond Street is architect.

A. Urquhart, 1640 St. James Street, Montreal, is in the market for a small screw cutting lathe, 3 to 5 ft. bed.

P. Hurtulise, Bourget, Que., is buildinga forge shop and is interested in prices and information on equipment.

The A. B. Ormsby Co., Ltd., manufacturer of rolling steel doors, sheet metal products, etc., has purchased the factory at 138-166 Van Horne Street, Toronto, formerly occupied by the Sorenson Sheet Metal Co. The Ormsby company will transfer the machinery from its old plant on King and Dufferin Streets to the new premises in the near future.

The Board of Education, London, Ont., is in the market for equipment and tools for a manual training department. A. N. Udy is chairman of the board.

J. Lacasse Shoe Co., Montreal, is in the market for equipment for a shoe factory. Z. Lacasse, 1771 Ave. de Chateaubriand is purchasing agent.

Newcombe & Tingley, Halifax, N. S., is in the market for polishing and stone cutting tools and equipment for monumental works. H. W. Tingley is purchasing agent.

The Champlain Tire & Rubber Co., Belleville, Ont., has leased a factory for the manufacture of tires, tubes and miscellaneous rubber goods.

The Quebec Harbor Commission, Quebec, is perfecting plans for the construction of a six-story cold storage plant on the waterfront, totaling about 500,000 cu. ft. of refrigerating space, with power plant adjoining, to cost $600,000 with machinery.

The J. B. Watson Furniture Co., Kincardine, Ont., propose to build addition to cost $20,000.

The Ottawa Electric Co., Ltd., Ottawa, Ont., is building a machine shop and power house, as well as a garage to cost $25,000.

The St. Regis Paper Co. of Canada, Ltd., Montreal, has awarded a general contract in connection with a $100,000 hydroelectric power development at Godbout, Que., to the Canadian Comstock Co., Montreal. The contract includes installation of water wheels, generators, penstock, transmission lines, pumps, motors and electrical distributors.

Western Canada

The Victoria Lumber & Mfg. Co., Chemainus, B. C., will rebuild its factory recently destroyed by fire and is in market for equipment.

The Hammond Cedar Milling Co., Port Coquitlam, B. C., is building a lumber mill to cost $200,000 and is in the market for equipment. D. Hartnell is purchasing agent.

The United Shingle Mills, New Westminster, B. C., will rebuild shingle mill recently destroyed by fire and is asking for machinery and equipment for a new factory.

A company in which H. W. Kent of Portland, Ore., and B. A. Strawbridge of Seattle, Wash., are interested plan the erection of lumber mill, woodpulp and sulphite mill at Edmonds, Vancouver Island, B. C.

The United Grain Growers Ltd., Winnipeg, Man., is planning an addition to the elevator at Port Arthur, Ont., to cost $1,200,000.

STEEL AND INDUSTRIAL STOCKS

The range of prices on active steel and industrial stocks from Monday of last week to Monday of this week was as follows:

	Low	High		Low	High
Allis-Chalmers ..	42½	45⅛	Inland	38	39¼
Am. B. S. & Fdy.	75½	77¼	Int. Har.	76½	78¼
American Can ..	102	105⅝	Int. Har. pf.....	107¼	108¼
Am. Can pf.....	109⅛	110¼	Jones & L'ghlin..	108	108
Am. Car & Fdry.	160½	168½	Lima Loco.	64⅝	67¾
Am. Car & F. pf.	122½	122½	Midvale Steel ..	28¼	29⅛
American Loco..	72½	74¾	Nat.-Acme	8⅝	9
Am. Loco. pf....	117	117	Nat. En. & Stm.	39½	40⅝
Am. Radiator...	86	95	N. Y. Air Brake	40½	41
Am. Radiator pf.	123	123	Nova Scotia Stl..	14½	14¼
Am. Stl. Fdries.	38⅛	40⅞	Otis Steel	8¾	9¾
Am. Stl. Fd. pf..	101½	102	Otis Steel pf....	57	57½
Baldwin Loco...	124⅝	128	Pressed Steel Car	53½	55
Bald. Loco. pf...	111	111	Pressed Steel pf.	84	84
Bethlehem Steel.	52¼	54½	Replogle Steel...	12⅛	13¼
Beth. Stl. 7% pf.	92	93	Republic	47½	49
Br. Em. Steel...	4⅜	4⅜	Republic pf. ...	92	92½
Br. Em. Stl. 1 pf.	13¼	13½	Steel of Canada..	72	73½
Cambria Iron ..	39	39	Superior Steel ..	31½	31½
Chic. Pneu. Tool	83¼	84	Transue-Wms. ..	33⅜	34
Colo. Fuel	23½	24½	Un. Alloy Steel..	30¾	31
Crucible Steel ..	66	68½	U. S. Pipe.....	54¼	59¼
Crucible Stl. pf..	90½	90¾	U. S. Pipe pf....	82	83
Deere pf.	61½	62	U. S. Steel.....	94½	95¾
Gen. Electric ...181		197	U. S. Steel pf...118⅝		119
Gt. No. Ore Cert.	32	32¾	Vanadium Steel.	29⅞	31½
Gulf States Steel	79½	83½	W'house Air Br..	84⅞	85
Harbison-Walk..114		115	Y'gstown S. & T.	68⅞	69½

Industrial Finances

Plant of the Barney & Smith Car Co., Dayton, Ohio, will again be offered for sale Dec. 14, at the request of a bidder who was unable to attend the sale Dec. 5, at which no bidders appeared.

Supplementing the recent announcement of the merging of the Advance Pump & Compressor Co., Battle Creek, Mich., with the American Steam Pump Co. of that city, President Richard R. Hicks, of the American company, called a meeting of the stockholders, at which a stock dividend of 68 per cent, or $340,000, was declared, in addition to deciding to increase the capital stock from $500,000 to $1,000,000. The merger adds 45,000 ft. of manufacturing space to the American plant, which now has a total of 205,000 sq. ft. Officers of the American Steam Pump Co., which are the same as before the merger are: Richard R. Hicks, president and treasurer; John W. Bailey, vice-president: Walter R. Munn, secretary, and M. C. Abbey, superintendent.

The Hanna Furnace Co. has declared a quarterly dividend of 2 per cent on the preferred stock, payable Dec. 15 to stock of record Dec. 5.

Directors of the Motor Wheel corporation, Lansing, Mich., have declared a dividend of 2 per cent in cash on the common stock payable Dec. 20 to stock of record Dec. 10.

Stockholders of the Atlas Steel Co. have been notified that liquidation of the corporation may be necessary unless the offering of $3,000,000 8 per cent cumulative preferred stock is supported. Notwithstanding the handicap of insufficient working capital, earnings of the company for the year ending Oct. 1, last, were $328,964.

The Hartford Electric Steel Corporation, Hartford, Conn., has filed a preliminary certificate of dissolution.

Judge Thomas, United States District Court, has named Louis L. Driggs and A. Lapides receivers for the Driggs Ordnance & Mfg. Co. The Cincinnati Body Co. claims $27,665.

NEW TRADE PUBLICATIONS

Concrete Flooring Preparations.—The Master Builders Co., Cleveland. Two pamphlets descriptive of two new products, "Colormix," a preparation for mixing with concrete to give a permanent color to concrete floors, and "Quickfix," a concrete floor patcher. "Colormix" is manufactured in seven colors, tile red, battleship gray, linoleum brown, nile green, buff, white and black. With "Quickfix" it is claimed that it makes old floors like new, the patch hardening within 48 hr.

Wrought Pipe.—The National Tube Co., Pittsburgh. Pamphlet entitled, "Seven Wonders of Wrought Pipe," relating various accidents which gave thorough tests of the strength, ductility and uniformity of National wrought pipe.

Paint.—Aluminum Co. of America, New Kensington, Pa. A pamphlet on the composition and characteristics and the special properties of aluminum paint.

Alloy for Dies.—The Cutler-Hammer Mfg. Co., Milwaukee, Wis. A pamphlet on "Kinite," a cast alloy of steel for use in making drawing, blanking or forming dies. Scores are illustrated. "Kompite" dies are also shown and discussed. The publication supersedes No. 2034.

Small Tools and Gages.—Pratt & Whitney Co., Hartford. Catalog No. 11, about 500 pages, 5 x 7¼ in. in size, contains sizes and prices of the company's small tools and gages. The catalog is divided into ten sections and includes an index. Material is conveniently arranged and illustrations are numerous. The section on taps includes an outline of the company's method of measuring the pitch diameter of screw threads. A section is devoted to dies and another to screw plates, the latter including one and two stock sets, and combination sets. The milling cutter section includes plain, side, inserted-blade milling cutters, gear cutters and many other types. A short section lists cutters for the company's machines. Many types of reamers are shown and sections are devoted to punches, drills and miscellaneous tools, respectively. The gages on which data and prices are given include the Hoke, Swedish type, standard measuring machine, super-micrometer, plug gages, and thread gages. Railroad gages are shown in a separate section. More than 50 pages are given to useful information, including tables.

Combined Barometer and Vacuum Recorder.—Uehling Instrument Co., Paterson, N. J. Bulletin 150, four pages. Describes and illustrates combined barometer and vacuum recorder for checking turbine and condenser performance. The illustrations include a sectional drawing and a full-sized reproduction of recorder chart. The instrument operates on the hydrostatic principle and diaphragms, tube springs and multiplying lever mechanisms have been eliminated.

Insulation.—Armstrong Cork & Insulation Co. Pittsburgh. In an attractive 64-page booklet, printed in two colors, has been gathered a large amount of data covering insulation problems where the temperatures involved are between 200 and 1500 deg. Fahr. The work is divided into sections dealing respectively with insulating materials, steam pipe covering, industrial equipment, stoves and ranges, engineering service, and definitions and tables. Special forms of insulating blocks are given particular attention, both by illustration and text matter.

New Books Received

History of the Union Pacific. By Nelson Trottman. Pages 412, 6 x 8¾ in., illustrated. Published by Ronald Press Co., 20 Vesey Street, New York. Price, $5.

Technical Writing. By T. A. Rickard. Pages 377, 5 x 7¼ in. Second edition, rewritten and enlarged. Published by John Wiley & Sons, Inc., 432 Fourth Avenue, New York. Price, $2.

Power Plant Machinery. Vol. 1, Mechanism of Steam Engines. Second edition, revised and enlarged. By Walter H. James and Myron W. Dole. Pages 277, 6 x 9 in.; 244 figures and 81 problems. Published by John Wiley & Sons, Inc., 432 Fourth Avenue, New York. Price, $3.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The following quotations are made by New York City warehouses.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipments in carload lots from mills, these prices are given for their convenience.

On a number of items the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general heading of "Iron and Steel Markets" and "Non-Ferrous Metals."

Iron and Soft Steel Bars and Shapes

Bars:	
Refined iron bars, base price	3.54c.
Swedish charcoal iron bars, base	7.00c. to 7.25c.
Soft steel bars, base price	3.54c.
Hoops, base price	5.19c.
Bands, base price	4.39c.
Beams and channels, angles and tees, 3 in. x ¼ in. and larger, base	3.64c.
Channels, angles and tees under 3 in. x ¼ in., base	3.54c.

Merchant Steel

	Per Lb.
Tire, 1½ x ½ in. and larger	3.60c.
(Smooth finish, 1 to 2½ x ¼ in. and larger)	4.10c.
Toe-calk, ½ x ⅝ in. and larger	4.60c.
Cold-rolled strip, soft and quarter hard	7.50c. to 8.50c.
Open-hearth, spring steel	4.50c. to 7.50c.
Shafting and Screw Stock:	
Rounds	4.40c. to 4.65c.
Squares, flats and hex	4.90c. to 5.15c.
Standard tool steel, base price	15.00c.
Extra tool steel	18.00c.
Special tool steel	23.00c.
High speed steel, 18 per cent tungsten	75c. to 80c.

Tank Plates—Steel

¼ in. and heavier	3.64c.

Sheets

Blue Annealed

	Per Lb.
No. 10	4.34c.
No. 12	4.39c.
No. 14	4.44c.
No. 16	4.54c.

Box Annealed—Black

	Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet Per Lb.
Nos. 18 to 20	4.40c. to 4.70c.	.....
Nos. 22 and 24	4.45c. to 4.85c.	5.10c.
No. 26	4.50c. to 4.90c.	5.15c.
No. 28	4.60c. to 5.00c.	5.25c.
No. 30	4.80c. to 5.20c.	.....

No. 28 and lighter, 36 in. wide, 20c. higher.

Galvanized

	Per Lb.
No. 14	4.70c. to 5.10c.
No. 16	4.85c. to 5.25c.
Nos. 18 and 20	5.00c. to 5.40c.
Nos. 22 and 24	5.15c. to 5.55c.
No. 26	5.30c. to 5.70c.
No. 27	5.45c. to 5.85c.
No. 28	5.60c. to 6.00c.
No. 30	6.05c. to 6.45c.

No. 28 and lighter, 36 in. wide, 20c. higher.

Welded Pipe

Standard Steel	Black	Galv.	*Wrought Iron*	Black	Galv.
½ in. Butt...	—41	—24	½ in. Butt...	— 4	+19
¾ in. Butt...	—46	—32	¾ in. Butt...	—11	+ 9
1-3 in. Butt..	—48	—34	1-1½ in. Butt.	—14	+ 6
2½-6 in. Lap.	—44	—30	2 in. Lap....	— 5	+14
7-8 in. Lap..	—41	—11	2½-6 in. Lap.	— 9	+ 9
9-12 in. Lap..	—34	— 6	7-12 in. Lap..	— 3	+16

Steel Wire

BASE PRICE* ON NO. 9 GAGE AND COARSER	Per Lb.
Bright basic	4.75c. to 5.00c.
Annealed soft	4.75c. to 5.00c.
Galvanized annealed	5.40c. to 5.65c.
Coppered basic	5.40c. to 5.65c.
Tinned soft Bessemer	6.40c. to 6.65c.

*Regular extras for lighter gage.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	17¾c. to 18¾c.
High brass wire	18¼c. to 19¼c.
Brass rods	15½c. to 16½c.
Brass tube, brazed	25¾c. to 27¼c.
Brass tube, seamless	22 c. to 23 c.
Copper tube, seamless	23½c. to 24½c.

Copper Sheets

Sheet copper, hot rolled, 21c. per lb. base.

Cold rolled, 14 oz. and heavier, 3c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14 x 20		
	Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20		Prime	Seconds
			80 lb.	$6.55	$6.30
			90 lb.	6.65	6.40
			100 lb.	6.75	6.50
IC.	$12.55	$10.70	IC.	7.00	6.75
IX.	13.95	12.55	IX.	8.25	8.00
IXX.	15.55	13.75	IXX.	9.50	9.25
IXXX.	17.10	15.30	IXXX.	10.75	10.50
IXXXX.	18.85	16.80	IXXXX.	12.00	10.75

Terne Plates

8 lb. coating, 14 x 20

100 lb.	$7.00 to $8.00
IC	7.25 to 8.25
IX	8.25 to 8.75
Fire door stock	9.00 to 10.00

Tin

Straits pig	50c.
Bar	58c. to 60c.

Copper

Lake ingot	15¾c.
Electrolytic	15¼c.
Casting	14¼c.

Spelter and Sheet Zinc

Western spelter	7¾c.
Sheet zinc, No. 9 base, casks	10½c. open 11c.

Lead and Solder*

American pig lead	8¼c. to 8¾c.
Bar lead	10c. to 12c.
Solder ½ and ½ guaranteed	34¾c.
No. 1 solder	32¾c.
Refined solder	28¾c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	75c. to 90c.
Commercial grade, per lb	35c. to 50c.
Grade D, per lb	25c. to 35c.

Antimony

Asiatic	11c. to 12c.

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb	36c.

Old Metals

The market is a little more active and values are firm. Dealers' buying prices are nominally as follows:

	Cents Per Lb.
Copper, heavy crucible	11.00
Copper, heavy wire	10.25
Copper, light bottoms	9.00
Brass, heavy	6.00
Brass, light	5.00
Heavy machine composition	9.00
No. 1 yellow brass turnings	6.25
No. 1 red brass or composition turnings	8.00
Lead, heavy	6.25
Lead, tea	5.25
Zinc	4.00
Cast aluminum	15.75
Sheet aluminum	15.75